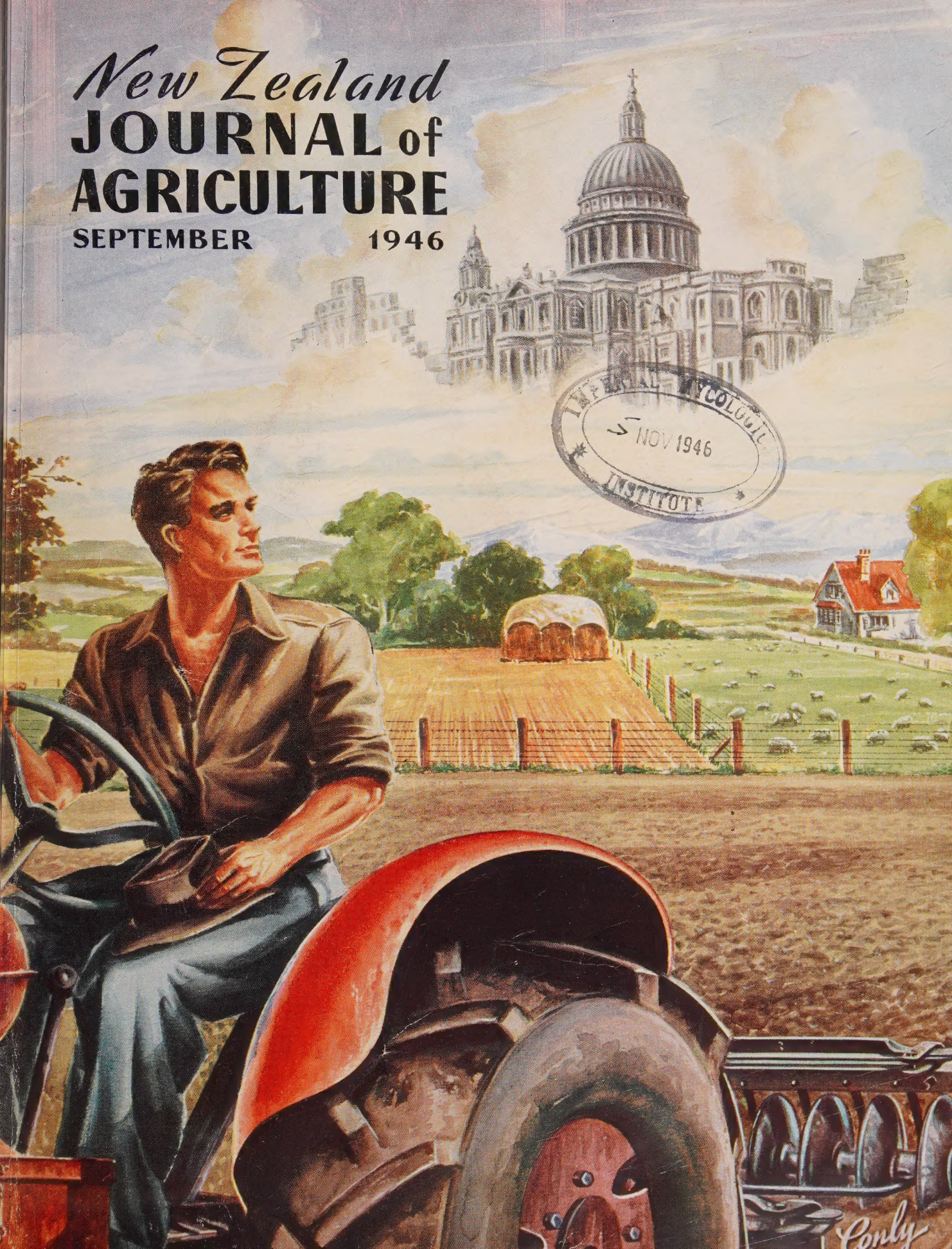
New Zealand JOURNAL of AGRICULTURE

SEPTEMBER 1946



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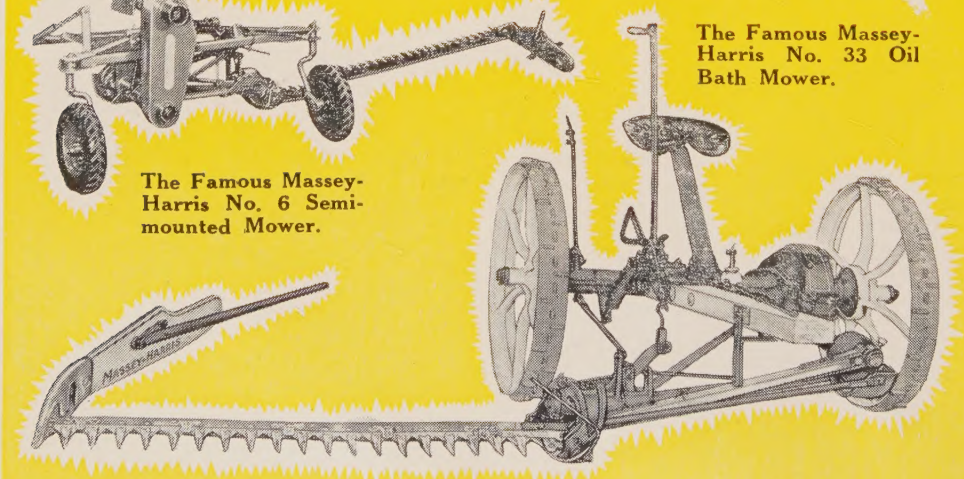

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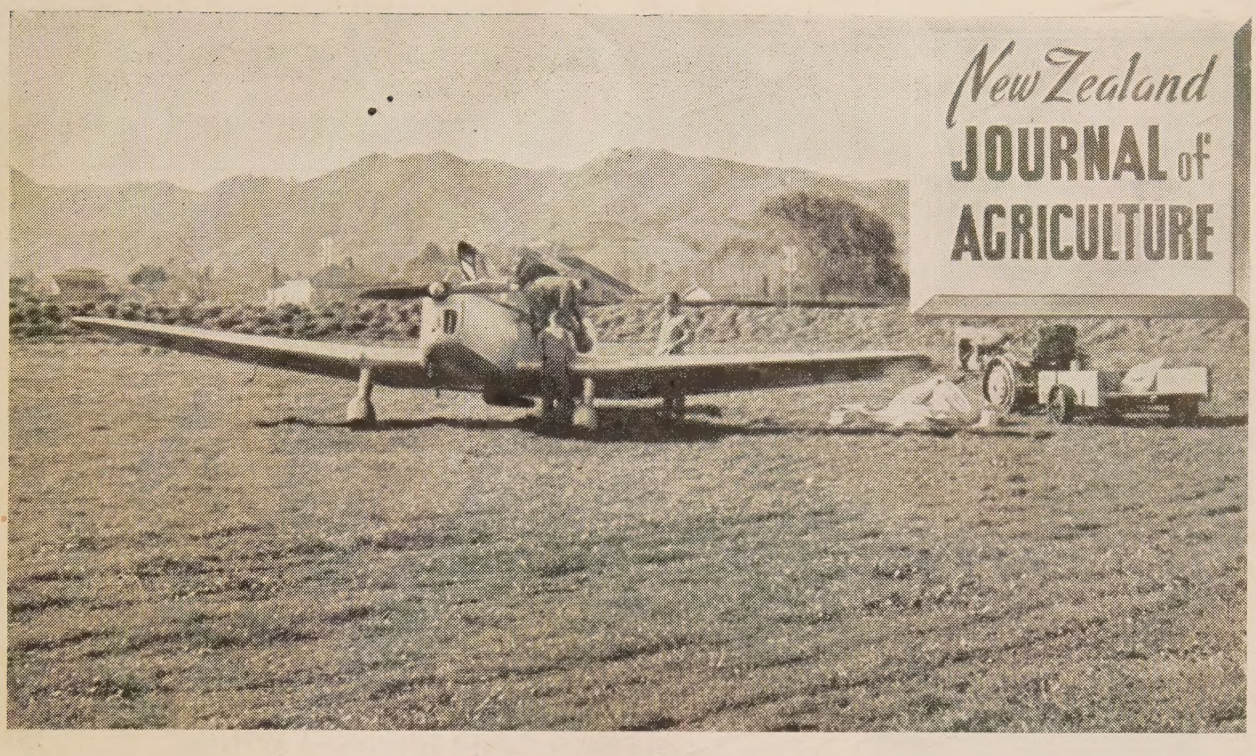

BLUESTONE TOPDRESSING FROM THE AIR

By O. J. C. ANDERSON, *Aerodrome Services, Public Works Department, Wellington, and* I. J. CUNNINGHAM, *Animal Research Station, Department of Agriculture, Wallaceville.*

TOPDRESSING with artificial fertilisers has been an important aid to pasture establishment and improvement in New Zealand's largely pastoral agricultural system. On hill country or flat land that is unsuited to the use of agricultural machinery, however, the cost and difficulties of spreading are much higher than on flat, even country, and the opinion that distribution from aircraft might offer a satisfactory solution under these more difficult conditions has been widespread.

CONSIDERABLE interest has been shown in overseas reports of successful employment of aircraft for seed sowing, for crop dusting, for insecticide distribution, and for spreading fertilisers. The war prevented study and development of uses of aircraft for such purposes in New Zealand, but recently Mr. A. M. Prichard, of the Aerodrome Services, Public Works Department, successfully carried out the sowing of lupin seed by air on the sand dunes of the Ninety Mile Beach. An account of this work, which appeared in the "Journal of Agriculture" for February, 1945, suggested that aerial distribution of light dressings of fertiliser was within the compass of the aircraft and equipment at present available.

The extensive areas of copper-deficient peat land in New Zealand provided a suitable opportunity to try out aerial topdressing under circumstances reasonably favourable to success. In this case the rate of topdressing, 5lb. or less of copper sulphate (bluestone) an acre, is light; some of the land is under development and is held in large blocks by one owner; the land is mostly flat and therefore suitable for steady flying, and methods of distribution from the ground are difficult because the surface of the land is unsuited to the use of farm machinery.

Moreover, great advantages are derived from topdressing such country with copper salts. The marked deficiency of copper in untreated land seriously affects farm stock; dairy cattle contract peat scours, a disease characterised by severe scouring, debilitation, and low production; lambs contract enzootic ataxia, a disease characterised by inability to walk normally and by a high death-rate between lambing and weaning. Topdressing with copper banishes these diseases and considerably increases the return from farming operations.

Arrangements were made to carry out experimental topdressing on an area of about 1,100 acres of peat land near Waitakaruru on the Hauraki Plains. The land, part of a large block under development by the Lands and Survey Department, is L-shaped, the long arm of the L being 1½ miles long and ¾ mile wide and the short arm about ¾ mile square. It is about 9 miles from Thames areodrome, which was the nearest ground suitable for a base. The proposal was to distribute about 5lb. of bluestone per acre.

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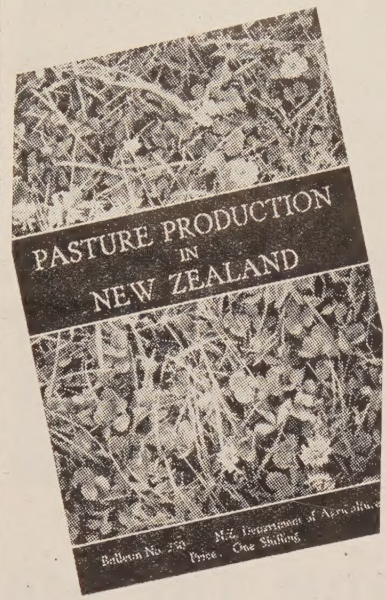

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Published by Direction of Hon. B. Roberts,
Minister of Agriculture.

Vol. 73, No. 3. September 16, 1946.

SUBSCRIPTION RATES.

The *Journal* is issued monthly. The subscription within New Zealand, which is payable in advance and includes postage, is 2s. 6d. a year. The overseas subscription is 5s. Subscriptions should be forwarded or paid direct to any office of the Department of Agriculture in the Dominion. Single copies, price 6d., are available from the Department of Agriculture, Box 3004, Wellington.

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BLUESTONE TOPDRESSING BY AIR

Aircraft and Fittings

The aircraft available was a Whitney straight low-wing monoplane. The complete distribution installation consisted of hopper, valve, and venturi. The metal hopper behind the pilot was in two main parts, the upper being 17in. x 21in. x 20in. and the base having walls set at an angle of 45 degrees to assist free flow of the fertiliser. At the bottom was a valve orifice 5in. x 2¾in. controlled by the pilot and opening by ¼in. steps from a minimum orifice of 5in. x ¼in. to the full open position.

The walls of the valve orifice extended through the fuselage to the large discharge venturi. A venturi in simple form has, essentially, a broad mouth tapering to a constricted throat, then widening to the trailing end. It is fitted to the aircraft so that the air flow passes through it and the velocity of the air is considerably increased at the constriction. The venturi employed was 3ft. long, the mouth was 9in. in diameter, the constricted throat 5in. in diameter, and the trailing end was flared out in fish-tail pattern 25in. wide to assist the initial spread of the bluestone. Its design was governed on this first occasion by ease of construction and assembly rather than by width of spread possible, which must be a leading consideration in the final design.

Special precautions were taken to ensure that the hopper and its lid were completely dust tight so that no bluestone could escape into the cockpit. The hopper was not airtight and there was no possibility of a partial vacuum being created as the fertiliser was discharged.

Preparation of Bluestone

The work was carried out with commercial crushed bluestone, as preparation of a special grade of definite particle size would increase the overhead cost of topdressing. Crushed bluestone does not, however, run freely and it was essential for proper operation that the material used should do this. A number of experimental mixtures were made and it was found that addition of ½ per cent. by weight of slaked lime, carbon black, or "light" magnesium carbonate promoted very free running. As the slaked lime and carbon black mixtures caused marked nasal irritation and would introduce a hazard to the pilot, the light magnesium carbonate mixture, which had very little irritant effect, was chosen.

Preliminary Trials

Topdressing was carried out during the week beginning July 15, the fitting of the hopper and venturi being made on the aerodrome. It was necessary to calibrate the valve and to determine the rate of flow and width of spread and also the most suitable altitude and speed at which to operate.

Type of country topdressed.

The hopper valve was calibrated by measuring the rate of flow of the bluestone mixture through the different aperture settings, on the ground and in the air, and the spread was determined by observing the deposit on the shell banks adjoining the Thames aerodrome. After initial experience the speed of the aeroplane during topdressing was fixed at 100 miles per hour and the altitude at about 75ft. From these figures it was possible to calculate the aperture and distance between runs necessary to give the requisite rate of topdressing. Calculations made from trial runs did not agree exactly with performance in actual work, and modifications were necessary to meet certain difficulties.

The weather before and during the experiment was very wet and the bluestone-magnesium carbonate mixture absorbed moisture from the damp atmosphere and lost some of its free-running properties. Large lumps which formed, though easily broken down by hand, did not break down in the hopper, and the mixture did not pass through the aperture freely and steadily even when it had been sieved just before loading. It was necessary to drive off the excess moisture with a covered fire. As too much heat would have expelled the chemically-bound water and reduced the bluestone to a very fine powder that would have possessed very different spreading properties, the drying had to be done carefully.

The square shape of the hopper and the tapered bottom, originally designed for the distribution of seed, proved unfavourable to free flow of bluestone. The vibration of the aircraft in flight appeared to pack the load into corners in the hopper, and considerably freer running was obtained by fitting a cone bottom and cylindrical upper portion inside the hopper. It was apparent that an agitator was necessary inside the hopper, but it was not possible to arrange this at the time.

As was anticipated, the deflection of the airflow through the venturi up into the valve orifice opening tended to restrict the free dropping of the bluestone, but the difficulty was overcome by a baffle which extended to the rear wall of the valve orifice and tended to create a suction there.

The width of spread varied with the strength and direction of the wind. When the aircraft was flying into the wind a spread of 25 yards was obtained; when there was no wind the spread was 35 yards, and when there was a strong cross wind of 15 to 20 m.p.h. the spread was up to 90 yards. Spreading was accompanied by separation of different-sized particles and the lighter particles were displaced most by the wind. In calm weather the heavier particles dropped immediately below the path of the aircraft, but in a strong cross wind they were carried up to 20 yards to one side by the time they reached the ground. Absence of proper communication between the air and the ground made it impossible to allow for this with any degree of exactness when spreading operations were in progress.

Spreading the Bluestone

When the necessary modifications were made to the equipment and the preliminary tests completed spreading was commenced.

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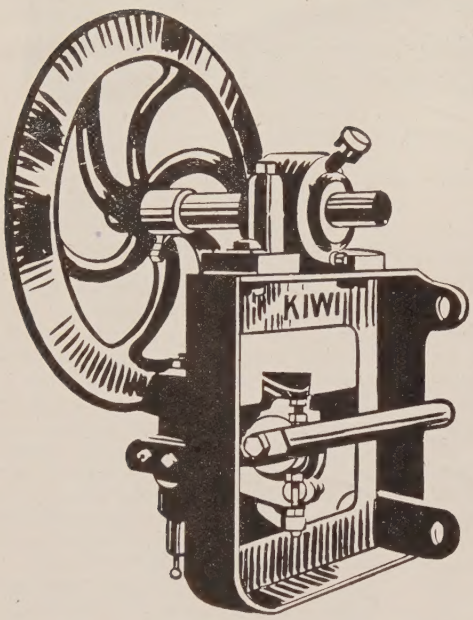

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BLUESTONE TOPDRESSING FROM THE AIR

The bluestone already deposited could not be seen from the aircraft nor was there any rear vision from the aircraft to permit the pilot to see the fertiliser cloud falling. The path of the aircraft was therefore indicated by a man stationed at each end holding a large white banner. Later, when the problem of rear vision was overcome, one end only of the run was so marked and it is possible that in future operations no marking would be necessary.

In nine hours 3,300lb. of bluestone were distributed over 1,100 acres. The rate of distribution was therefore 3lb. per acre, not the 5lb. which had originally been planned. There were reasons for this lighter rate of application, the chief being lack of communication between the air, the ground, and the aerodrome, so that it was impossible to obtain the data necessary to calculate the rate at which the bluestone was applied and to make the necessary alteration of prearranged plans. Communication had been provided for by the use of "walkie-talkie" outfits, but these proved useless for the distance and the conditions experienced. It was possible to make the appropriate calculations only after the first period of 4½ hours, or when half the topdressing was completed. At that time it was felt desirable to complete the whole operation at the same rate.

Evenness of Spread

It was intended to check the evenness of spread by weighing the bluestone deposited on sheets of paper laid in the path of the aircraft's flight. Intermittent rain made this plan impossible, and observations were limited to examination of the ground, many parts of which were free of vegetation and therefore well suited to the purpose. There was reasonably even distribution on all runs, but width of spread varied from 35 yards when no wind was blowing to 70 yards with the maximum cross wind experienced. Since there was a constant rate of discharge, the rate of application on different areas varied because of changing wind by as much as 100 per cent. By selecting conditions to avoid wind, say in early morning or evening, this source of error could be avoided.

Effectiveness of Operation

The effectiveness of the topdressing can be measured in terms of the effectiveness of the weight and distribution achieved in controlling stock ailments and of the cost as compared with other means of distribution.

Previous experience on similar soil with hand topdressing and animal experiments has shown that though 5lb. an acre is desirable, as little as 2½lb. of bluestone an acre will give a fairly good measure of control of stock disease; it was for this reason that the operation was completed at 3lb. an acre when it was found that the first half of the area was done at this rate.

Exact evenness of distribution is not essential when topdressing with bluestone, as the lower copper content of pasture on areas topdressed at low rates is made up by the high copper content of areas topdressed at higher rates, provided the grazing animal has free access over the whole area. In this respect bluestone topdressing is peculiarly suitable for aerial application. The work was satisfactorily carried out in so far as control of animal disease is considered, and the experience gained would permit more satisfactory distribution in the future.

The cost of aerial application was somewhat less than application from the ground would have been, because hand topdressing would have been necessary in ground application, as the surface was unsuitable for machinery.

Experience has shown that hand topdressing costs slightly more than 1s. 6d. an acre, or a total of at least £82 10s. for 1,100 acres. Moreover, bluestone causes considerable pain and discomfort to operators when some of it inevitably lodges in eyes, nose, or mouth. Cost of the aircraft, pilot, and aircraft engineer is £4 an hour, and additional labour in loading aircraft and providing direction on the ground would not be greater than £1 an hour. Nine hours' operation would cost £45, plus charges for bringing aircraft to the district. Bluestone was handled for a considerably shorter period in aerial topdressing, and the amount of discomfort was correspondingly less.

There would be little difference in costs of hand distribution whether 3lb. or 5lb. an acre was distributed, but the cost of aerial distribution would be directly proportional to weight handled. Thus the £45 calculated above would become £75 if 5lb. instead of 3lb. an acre had been spread.

It should be pointed out, however, that the experimental aircraft used had a smaller load than would be desirable in a commercial undertaking. Dead flying time, and therefore, costs, would be considerably reduced with a heavier load. The aerodrome was some distance from the operations and it would be desirable for economic reasons to have a landing ground nearer the area topdressed This would have been feasible had the operation been carried out in the dry weather of autumn, which is the normal time for topdressing.

The fertiliser cloud falling from the aeroplane.

The writers feel that the experiment has shown that light rates of bluestone topdressing over large areas can be accomplished satisfactorily and economically from the air. The results indicate that considerable study and modification would be necessary before bluestone could be applied to single small farms if, indeed, this ever is practicable; however, groups of adjacent farms might be topdressed by common agreement and arrangement of the owners.

The experiment does suggest also that a successful approach might be made to the problem of topdressing hill country with cobalt sulphate, which, as a fertiliser, is required in very small quantities per acre.

The small aircraft employed would obviously be unsuited for attempts to spread fertilisers such as superphosphate at the rate of hundredweights per acre. The work has, in fact, no direct application to problems associated with such an enterprise. Nevertheless, the experience gained by the collaborating parties would be of great value in making a preliminary approach to this problem with better and more suitable equipment.

The experiment was made possible by the earlier work of Mr. A. M. Prichard on the use of aircraft for seed sowing and by his studies of the possibilities of aircraft for fertiliser spreading. The writers are indebted to him for advice and help in design of the equipment, to Mr. J. Frizzell, aircraft engineer, Public Works Department, for fitting and maintenance of the equipment, and to Mr. F. A. Linton, Lands and Survey Department, Kerepeehi, for ground organisation at the aerodrome in connection with preparation and loading of the bluestone. The aircraft was piloted by one of the writers—O. J. C. Anderson.

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PLANT HORMONES

Use In Orchard And Garden

By J. P. HUDSON, *Horticulture Division, Wellington.*

IN addition to their value in plant propagation and transplanting, hormones may find an important use to assist tomato growers to get a better set of fruit under adverse conditions (fruit-set hormones), to ensure that certain stone and pip fruits do not fall off the tree before they are ready to be picked (fruit-drop hormones), and to kill certain types of weeds without affecting the crop in which they are growing (weed-killing hormones).

FRUIT-SET HORMONES

A BRIGHT juicy fruit is one of Nature's seed dispersal mechanisms for ensuring that the seeds are spread far from the parent plant. The fruit is designed to attract animals or birds which scatter the seeds as, or after, they eat the flesh (many seeds being still capable of germinating after passing through an animal's digestive tract).

In most cases the fruit grows and ripens only if the seeds within it are also developing. If the seed does not set (i.e., the ovule is not fertilised by the pollen grain), no fruit normally develops. There are certain exceptions to this general rule. For example, bananas and seedless oranges are fruits which develop without seeds, while some types of cucumbers and Conference pears are examples of fruit which normally have seeds but which in certain circumstances may develop without seeds.

"Chemical Messenger"

In those fruits which develop only if the seeds have set, it is supposed by botanists that when the ovule is fertilised it sends a "chemical messenger" (hormone) to the appropriate growth cells to make them start multiplying and building up the flesh of the fruit. If the ovule is not fertilised, no hormone messenger is despatched and the fruit does not swell.

Growers of glasshouse tomatoes are familiar with the difficulties of producing fruit during the winter months. Even though the plants are healthy and producing apparently normal flowers, little fruit may develop. When the flowers fall they leave a cream-coloured "embryo" fruit, smaller than a grain of rice, which never grows any bigger. This failure of the flowers to set in winter is principally due to the fact that most of the pollen grains at that season of the year are sterile and incapable of fertilising the ovules. The reason for sterility of the pollen is still not clearly understood; but the results of this sterility are only too well known to growers, who may find that the bottom one or two trusses of their tomato plants are bearing little or no fruit.

Experiments in England and America have shown that certain chemicals (hormones) can be used to make tomato fruits start growing, even though no seeds have set. Such fruits look very similar to normal tomatoes, but they have no seeds inside and taste rather insipid and slightly sweeter than ordinary fruit—a disadvantage to those who prefer a tomato to have a tang, but not an objection to those who prefer the less acid varieties. Analysis of these seedless fruits shows them to contain the normal content of vitamin C.

The chemicals used are dissolved in water in great dilution (e.g., fifty parts per million in the case of one hormone, beta naphthoxy acetic acid) and are sprayed on to the flower truss by a scent spray or small hand atomiser. It is essential to soak thoroughly both the inside of the base of the flower and the outside of the flower stalk, and it is best not to apply the spray until the last flower on a truss is wide open, since an application at this time will cause all the fruits on the truss to swell and ripen together. **This treatment would, of course, be given only if at this stage it is seen that the first flowers in the truss have failed to set.** The hormone will cause unset fruits to develop and ripen if it is applied any time up to three weeks after the petals of the flowers have fallen off. The treated fruits will be ready to pick about two months after treatment (the normal time taken for development of tomato fruit). They have sometimes been slightly smaller than normal, but as every flower on the truss will develop into a fruit, the total weight of fruit on the truss may be above average.

It is advisable not to wet the growing point of the plant with the spray because the hormones may cause distortion of young growth.

Fig. 1.—Lawn badly infested with plantain, catsear, and white clover.

Crop Must Be Healthy

Hormone treatment will not produce a good crop of tomatoes from a poor, unhealthy, or starved plant, nor will it cause a fruit to develop from stunted or ill-nourished flowers. It is effective only on healthy, vigorous plants with well-formed trusses of flowers.

So many fruits may be set by the hormone spray that an even more than normal vigour in the plant may be required to swell and ripen them all. Very vigorous growth in tomato plants has been avoided in the past, because flowers set so badly on soft, gross plants. Yet it has been suggested by Dr. T. Swarbrick, in England, that this vigorous type of plant may be the one to give the greatest weight of crop if the hormone treatment is used to assist it form its fruits.

No records of trials of the fruit-set hormones on tomatoes have yet been published in New Zealand, although hormones of this type are now on sale. A great deal of interest is, however, being shown in the subject both by commercial growers and amateurs. No doubt, the use of hormones at first will lead to some results being successful and others disappointing, depending on whether the purpose of the treatment is properly understood. It seems probable that the fruit-set hormones, correctly applied, will prove of great value to tomato growers by enabling them to overcome certain adverse growing conditions.

It must be made quite clear that this treatment is not intended to replace the natural setting of tomatoes, which should, of course, be encouraged whenever possible. Hormones are likely to prove useful only in "saving the situation" if the fruit has not set naturally. There is no point in purposely trying to produce seedless tomatoes, unless the public develop a preference for such tomatoes.

FRUIT-DROP HORMONES

When aged leaves or mature fruits fall from a plant they do so because a layer of cork has been deposited across the stem of the leaf or fruit. The corky layer, extending most of the way across the stem, represents a "weak link" at which the stem is ultimately broken by the weight of the leaf or fruit, or earlier if the leaf or fruit starts to swing from side to side in a wind, or when the fruit is picked. The wound at the break is already healed by the corky layer when the stem breaks off.

It is a great advantage if some types of fruit, such as apples, can be left on the tree until really ready to be picked, since they will then be in better condition for storing or marketing. During the few days before the fruit is quite ready for picking, however, the cork layer has already started to form across the fruit stalk, and as a high wind at this time may blow much of the crop off the tree, it is a most anxious period for the fruit grower. He has to decide whether to pick the fruit before it is quite at its best, or wait until it is in perfect condition for picking and run the risk of losing much fruit should a gale spring up.

Delaying Formation of Cork

Certain hormones when properly applied have the effect of delaying the formation of the cork layer, and this promises to be a great boon to growers of certain types of fruit, although full trials of the treatment have not yet been made in New Zealand. In America, Holland, and England fruit-drop hormones greatly diluted (ten to twenty parts per million of water) have been applied to trees five to ten days before the fruit would normally start to drop heavily. Provided the fruit stalk was thoroughly wetted, the hormones have usually had the effect of delaying the formation of the cork layer, thus causing the fruits to hang on the trees much longer than usual. Generally the long-stemmed varieties seem to have responded best to this treatment, which is most effective when applied in relatively warm weather.

Apple growers overseas not only confirm that the fruit-drop hormones reduce windfalls, but claim that the hormone-treated fruit is of better quality because of its longer period of tree ripening. This may be true in the case of apples marketed as soon as they are picked, but careful trials are required to show the effect of fruit-drop hormones on the quality of fruit which has to undergo prolonged storage after picking, as is the case with most of the apple crop in New Zealand. While the hormones delay **dropping,** they do not delay **ripening,** and care has to be taken to pick the fruit at the proper stage of ripeness, especially when it is to be stored, even though it would have safely hung on the tree past that stage.

Spraying Effective for Three Weeks

Overseas a single spraying with fruit-drop hormones has remained effective on most varieties for about three weeks. This period can be

Fig. 2.—Three days after spraying with hormone leaf stalks of clover plants are curiously curled and twisted and plantain leaves are beginning to curl.

Fig. 3.—The same lawn two weeks after applying the weed-killing hormone, showing extreme distortion of plantain leaves. All the weeds died within a month of spraying with hormone.

prolonged, if required, by another application of the spray put on about a fortnight after the first.

An overdose of the fruit-drop hormone may cause the fruit to adhere so firmly to the tree that it becomes almost impossible to pick it without causing damage to next year's fruiting spur.

Although there is still much not known about the fruit-drop hormones, it looks as though it may be well worth while to use them on varieties which respond either when a heavy drop of fruit is expected before it is ready to be picked, or when circumstances would compel a grower to pick fruit before it is ready. Trials to ascertain the effect of hormones and the best method of using them under New Zealand conditions are being carried out by the Plant Diseases Division of the Department of Scientific and Industrial Research and by a number of interested orchardists.

WEED-KILLING HORMONES

Weeds rob garden plants of water and food and can perhaps be regarded as the gardener's worst enemy, although the damage they do to crop plants may be less obvious than that caused by pest or disease. Wherever possible crop plants are grown in rows, spaced sufficiently wide apart to allow cultivation between the rows to kill many of the weeds while they are still quite small.

Correct Chemical Essential

More recently it has been found that hormones can be used to kill certain weeds in growing crops without injury to the crops themselves. The various hormones are to some extent "specific" in their action, and to get a good kill of any particular weed without damage to the crop, the correct chemical, applied at the right time and at the proper concentration, must be used.

Only a few preliminary trials have so far been carried out by the Department of Agriculture with the use of hormone weed-killers in the control of weeds in pastures and crops, but with much greater quantities coming to hand at an early date an extensive experimental programme is planned. Experiments have also been made by various divisions of the Department of Scientific and Industrial Research.

Unfortunately, many vegetables, such as carrots, beans, onions, and the cabbage family, and many ornamental plants, are also susceptible to the effect of hormone weed-killers. It would be most unwise to apply weed-killing hormones in the vegetable or flower garden until more is known about their effects on garden plants. Moreover, the application of hormones to weeds on a vacant plot in the garden must be done very carefully on a calm day, as there is a real danger of spray or dust "drift" damaging nearby garden plants.

Hormone weed-killers have a peculiar effect on those plants which they attack. The plants usually show no symptoms at all for two or three days, after which the stems and leaf-stalks start to swell and curl, giving the plants a distorted appearance. The plants make no further growth, and gradually die. The hormone also kills any seedlings of susceptible plants which may start to grow during the first few weeks after the application has been made.

Trial on Weedy Lawn

A trial of weed-killing hormone made on a very weedy lawn in Wellington gave spectacular results. Within 24 hours of the application plants of plantain, catsear, and white clover began to have a distorted appearance, and all these weeds ultimately died within a month of the date of spraying, leaving the lawn grasses unaffected. No weed seedlings appeared on the bare places until seven weeks after spraying. One month after the application the surface was raked vigorously and more grass seed was sown to thicken up the turf. Germination of this grass seed appears to have been unaffected by the hormone weed-killer, although it would not have been advisable to sow it sooner than about a month after treatment. The lawn on which this trial was made was in such a neglected condition that no normal treatment would have been of much value in eradicating the weeds, which could best have been done by digging the lawn over and re-sowing it.

Conclusion

A very well-known plant physiologist has stated that it was a pity that the discovery of hormones left the laboratory so soon, and that they were put to commercial use too early. On the other hand, it has been said that "the use of hormones enables the growth of a plant to be absolutely controlled, either slowing it down or speeding it up at will."

The truth of the matter lies somewhere between these two extreme views, but there can be little doubt that more and more will be heard of the various plant hormones and that their use will ultimately become a part of standard garden practice.

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STUDIES IN FARM MANAGEMENT

A Manukau Mixed Farm

NEARLY two million bushels of grain are at present imported annually into the Auckland Province for stock feed, and this quantity could be increased with advantage in the feeding of pigs. The Manukau County, now devoted almost entirely to dairy farming, at one time had extensive areas of cereal crops. A combination of dairy farming with mixed cropping, which has much to recommend it under present conditions, is discussed in this article.

By A. D. MERCER, *Fields Instructor, Auckland.*

THE Manukau County extends from the west coast of the North Island to the coast of the Firth of Thames for about 20 miles south of Auckland City and comprises many various types of country and soil. Most of the county was originally forest clad, and before it was roaded isolated settlements were linked with Auckland by the waterways of the deeply-indented arms of the Manukau Harbour and of the Tamaki Inlet. There are no extensive tracts of flat land, most being easy rolling country with some steep hills on the east coast.

Soils of the County

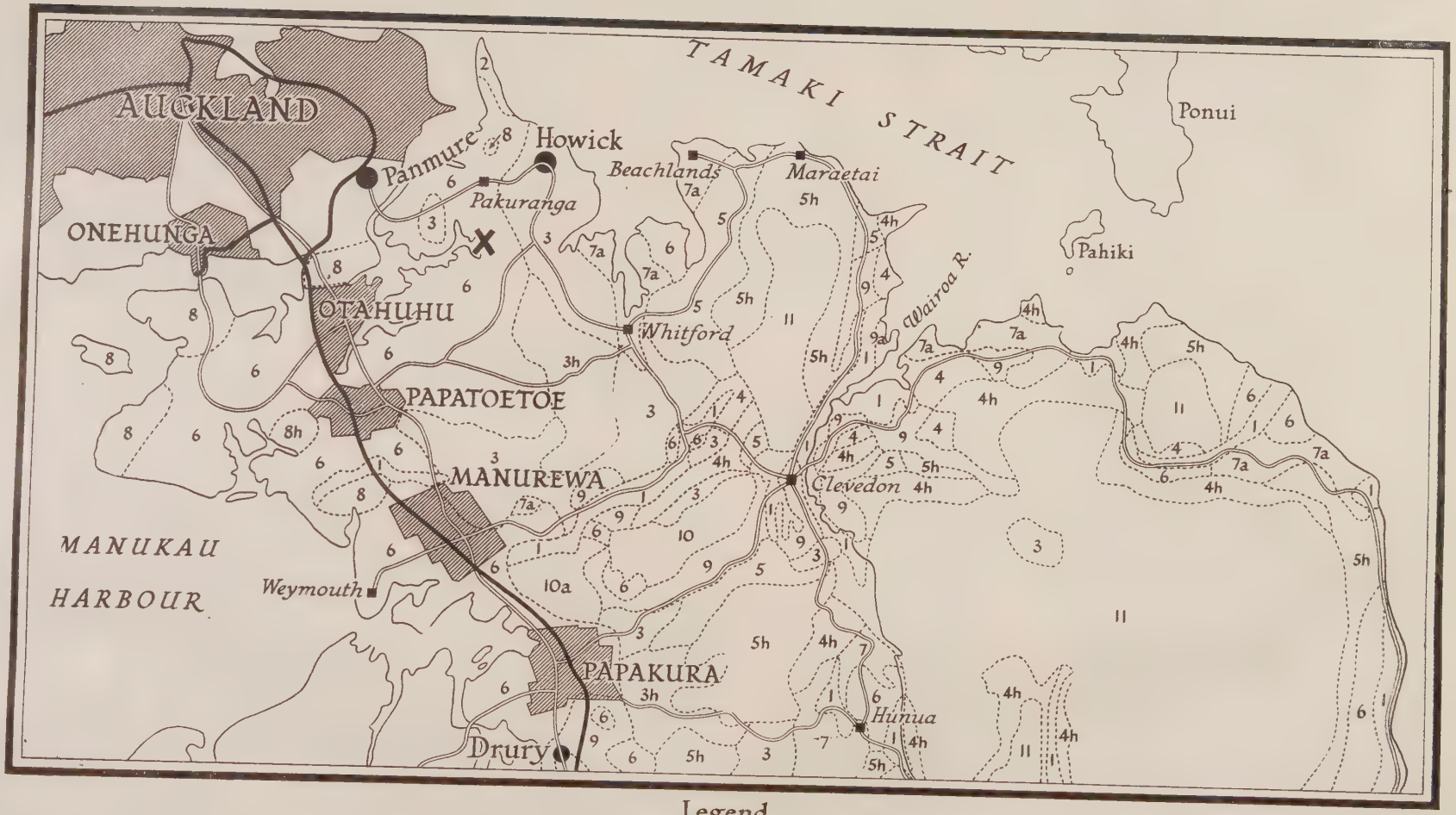
Close to Auckland are areas of volcanic soil derived from the fifty or so volcanic cones scattered within a short radius of the city, and these soils are especially favoured for market garden operations. By far the larger proportion of the soils of the county are brown loams, clay, and silt derived from mudstones and sandstones, varying considerably in natural fertility. A further distinct soil type is provided by the meadow soils and peats extending from Papakura through Clevedon along the Wairoa Valley. With the exception of the volcanic type, most of these soils are retentive of moisture, and the disposal of surface water even on the hills during winter becomes something of a problem under dairying conditions.

For many years after clearing large areas of this country supported a sward of browntop, but improvement of fertility by increased stocking resulting from applications of lime and phosphate has resulted in good mixed pastures of rye, cocksfoot, and clover over large areas formerly considered of doubtful value. This type of country is situated mainly in the eastern portion of the county, and though much of it is still devoted to sheep farming, considerable areas have been improved to the stage of maintaining dairy herds.

Climate Favours Grass

With an average annual rainfall of 45in. fairly well distributed throughout the year, and a mild climate almost free of frost, conditions are favourable to grassland dairy farming, and this constitutes the chief farming activity, with a large proportion of the herds supplying milk to Auckland. There are approximately 28,500 dairy cows in milk, giving a ratio of 25 for every 100 sheep shorn. Dairying either for factory or town supply is carried on in all parts of the county except on the hill country along the east coast, which is devoted to fat lamb raising and store sheep. Near Auckland are many small holdings raising market garden produce, and for these vegetable crops the volcanic soil is particularly favoured.

Under the favourable climatic conditions growth of grass is maintained practically throughout the year, except for occasional dry summer periods, and the minimum of effort is applied to the supplementary feeding of dairy stock, the growing of fodder crops being the exception rather than the rule. The latest figures available



Legend

Soils from alluvial flats	1
Immature clays from limey mudstone	2
Immature clays & clay loams from sandstone	3
Immature clays & clay loams from greywacke	4
Semi-mature & mature clays & loams (gumlands & related soils)	5
Yellow-brown loams & granular clay loams from reworked volcanic ash	6
Complexes of granular clay loams & semi-mature clays	7
h after a number indicates that the soil types are hilly	h

Complexes of yellow-brown loams & gumlands	7a
Red-brown loams from basalt	8
Meadow soils	9
Meadow soils, poorly drained types	9a
Mellow peaty soils	10
Acid peaty soils	10a
Skeletal soils of steep hills (mainly greywacke)	11
Location of farm marked	X

VIEW OF PAKURANGA FARM LAND

show a total of 580 acres of fodder and root crops for the county in a year. Haymaking is a usual practice on most dairy farms and an allowance of 10cwt. per cow for the winter is generally considered adequate. Little silage is made except in certain areas where green pea vines from the canning plants are available—material which is highly valued for silage. Among town supply dairymen brewers grains from Auckland are in great demand as supplementary feed and are probably overvalued from the nutritional point of view.

Reliable figures of the production of milk per cow yearly among herds supplying milk to the city are not readily available, but a survey carried out for 1942 on a number of town supply dairy farms gave an average of 513 gallons per cow on the total number of cows carried.

All the dairy breeds are represented among the livestock of the county, but Jersey and Jersey crosses are predominant.

Pakuranga District

Parts of the Manukau County have special points of interest, both agricultural and historical, and a closer study of a small area brings some of these points to light. The Pakuranga district, situated about 12 miles from Auckland on the road to Howick, is now a typical grassland dairying district, but at one time, together with the adjacent area of East Tamaki, it was the granary of Auckland. The land was taken up early in the history of the province largely by settlers of English farming stock, and the gorse and hawthorn hedges still surviving, together with the number of well-grown oak trees about the countryside, influence one to the conclusion that had the dust-bowl area of other lands been in the care of farmers of this type, there would have been no denuded lands today, quite irrespective of the tillage implements they may have employed.

The soil of the district is a silt loam over a clay subsoil, and with adequate drainage is good corn land. On the farm of Mr. R. Hattaway wheat was grown continuously in the rotation for 50 years, from 1867 to 1917. From some farms wheat was transported by cutters down the tidal creeks to the Tamaki Inlet and Auckland.

Plan of Farm.
Crops in 1945-46.

In the somewhat humid climate the moisture content of the wheat was probably rather high for milling and the grain would require blending, but up to 1914 wheat was grown fairly extensively, with a few farms persisting for some years longer in face of the increasing labour shortage.

At the present time Auckland is importing from outside sources 750,000 bushels of wheat annually for stock feed, together with a similar quantity of barley, oats, and maize, also for stock. While it is not possible to harvest a good sample of milling wheat in the Auckland district, the quality of wheat, barley, or maize for stock feed leaves nothing to be desired, and an extension of wheat growing with a view to a greater degree of self-sufficiency in the province in the feeding of pigs and poultry might assist a healthier agricultural economy and provide some contribution to present world problems.

STATISTICAL DATA: MANUKAU COUNTY, 1943-44.

Total occupied area	155,696	acres
Area in pasture	100,988	"
Area cut for hay and silage ..	8,491	"
Area under arable crops	843	"
Number of cows in milk	28,568	
Number of other cattle	19,117	
Number of sheep shorn	115,149	
Number of pigs	6,452	
Number of holdings	1,621	
Average area of holdings	96	"

A PAKURANGA FARM

Sole survivors of the wheat growers today are Mr. H. Ferguson, of East Tamaki, and Mr. R. A. Bell, of Pakuranga, who combines his cropping with a town supply dairy herd. Mr. Bell's

Upper—
Homestead.

Middle—Part of the dairy herd.

Lower—Farm buildings.

ON A MANUKAU FARM

farm was taken up by his family 70 years ago when the area was still in bush, and as development proceeded wheat and oaten chaff were sold as cash crops, and butter and eggs were taken into Ponsonby for sale. From about 1900 to 1914 cream was supplied to the butter factory at Pakuranga, and wheat, threshed by travelling steam plants, was delivered to Auckland mills by wagon. In 1914 supply of milk to Auckland was commenced in combination with cropping, and this policy has been continued by the present owner.

The farm is of 200 acres surrounded on three sides by a tidal creek, with a narrow road frontage and all paddocks draining by tile drains to the creek, a small arm of the Tamaki Inlet penetrating far inland.

Stock Carried

Stock carried on the farm includes 55 Friesian cows, 1 bull, 16 heifers, 20 calves, 6 horses, and 170 Romney ewes with Southdown rams. Drafts of store lambs are bought in as feed conditions allow.

Crops Grown

A typical annual cropping programme includes 10 acres of wheat, 10 acres of rye (for straw), 7 acres of oats (for chaff), 4 acres of turnips, and 3 acres of maize. In some years a crop of barley is taken for grain, and in a season when the moisture supply is adequate rape may be sown on the stubbles in January as a catch crop for feeding lambs.

Implements

A comprehensive range of farm implements includes a 20 h.p. tractor, 2 single-furrow ploughs, a spring-tine cultivator, a set of disc harrows, 2 sets of tine harrows, a binder, an 11-coulter drill, a 2-row ridger, a top-dresser, a hay sweep, a rake, a Cambridge roller, and a chaff cutter.

Practically all tillage operations are carried out by the horses, the tractor being employed only when an accumulation of work has to be overtaken, for grassland harrowing, and for the baling of hay and straw.

Water is supplied to all paddocks from three bores by two electric pumps and one windmill.

Crop Rotation and Cultivation

When old grassland is ploughed in the winter the paddock is sown in the spring, half in maize and half in turnips for summer feed for the cows. In the following year a crop of wheat or rye is taken, followed by oats for chaff, when the stubble is ploughed and sown down to grass in the autumn. Grass seed is never sown with the cereal crop.

Ewes yarded for crutching.

Ploughing is always carried out as early as possible in the autumn, and for subsequent cultivation the spring-tine cultivator is preferred, except on the grassland furrows, which are worked down with discs. Final working of the seed-bed is completed with tine harrows and the Cambridge roller.

Wheat of the Cross 7 variety has been found most suitable and is usually sown in August; rye is sown in June and fed off by sheep, though if weather conditions will not permit of June sowing it may be drilled in the early spring. Oats also are preferably autumn sown and fed off; barley is sown in the spring, maize in October, and turnips in three sowings from the end of October to the end of November.

Average yields over a number of years are—

Wheat: 40 bus. (47 bus. for 1946).
Rye: 1½ tons straw.
Barley: 30 bus.
Oats: 1½ tons chaff.

The total cost of sowing, harvesting, and threshing a crop of wheat and baling the straw is approximately £9 per acre, and the returns are as follows:—

40 bus. wheat at 7s. 3d. per bus.	£14 10s.
30cwt. straw at £5 per ton ..	£7 10s.
	£22 per acre

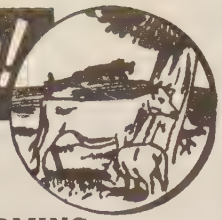
Wheat straw is baled as it comes off the mill during threshing.

Pasture Management

Fields 1, 2, and 3 and the small house paddocks have remained in pasture for many years, but over the rest of the farm the plough moves regularly, thus ensuring that no grassland is more than 6 to 8 years old. The frequent re-establishment of new pastures prevents the development of worn-out swards, provides ideal growth for improving the milk supply, and lessens the difficulty of raising young stock, whose health is liable to suffer from feeding on old pastures contaminated by older animals. In addition the following crops benefit to a greater extent than if the sward were allowed to run out before ploughing in. During the past season field 10 was in oats (for chaff) and barley, field 11 was sown to maize, turnips, and greenfeed, field 14 was in rye corn, and field 17 in wheat. The remainder was in pasture.

Pastures are topdressed every second year with ½ ton of lime and 3cwt. of superphosphate (when available) either in autumn or in early summer. After grazing in rotation by the milking cows, dry stock, and the sheep, they are harrowed and spelled. In the autumn some fields are closed for a longer period than normal to provide and hold winter growth for the milking cows. Fields are again shut up in the early spring for hay.

Hay is baled in the paddock and a reserve of 300 bales is carried over from year to year to guard against light crops in a dry season. About 30 acres are cut annually, providing in some years a surplus for sale.



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THRESHING YESTERDAY AND TODAY

Left—Threshing on the farm of R. Hattaway in 1911. Right—Threshing on H. Ferguson's farm in 1946.

The usual seed mixture sown after three years of cropping is as follows:

	lb. per acre
Perennial ryegrass	20
Italian ryegrass	5
Cocksfoot	3
Timothy	2
White clover	2
Montgomery red clover	3
	35

Herd Management

In the shifts of stock to fresh grazing the milking cows naturally receive preference and frequent changes of pasture. Maize and turnips have proved their value in ensuring adequate supplies of summer feed when grass growth slackens during a dry period, particularly during the past season when Auckland's summer was the driest on record. Many dairy herds went almost out of production by March, and failure of spring-sown fodder crops was almost the rule. On the heavier land of Pakuranga pastures did not shrivel up to the same extent as on the volcanic soils, while early and thorough cultivation secured reasonable crops of maize and turnips on Mr. Bell's farm, with only a slight reduction in milk yield over the crucial months of January, February, and March. Dry summers are of sufficiently common occurrence in Auckland to justify more attention being paid by most dairy farmers to the provision of supplementary feed.

During the winter the herd is grazed on the specially-saved pasture, hay is fed in the paddocks, and chaff (with bran when available) is fed to the cows in the bails. Thus throughout the year the cows are enabled to produce to their maximum capacity on home-grown feed, while the cropping policy gives added returns in cash and also that peculiar satisfaction derided by many today as of no economic value but derived by every true farmer from the contemplation of a well-turned furrow and the observation of a good crop through all its stages to maturity.

There is not much doubt that in periods of adversity, whether climatic or economic, the self-contained farm, with a moderate-sized herd adequately fed to high production and combined with the growing of saleable farm crops, affords the best safeguard against financial loss.

Of the 55 cows carried, 40 are milking at any given time, with 15 dry, and the production of milk for the year ended May 31, 1946, taken over the total of 55 cows, gave an average of 727 gallons per cow, without taking into account milk consumed by the households and the calves. In comparing this figure for this year with the county average of 513 gallons in 1942, it should also be borne in mind that this summer was the driest on record in Auckland and considered almost disastrous by many dairy farmers.

Sheep

The 170 Romney ewes carried are put to Southdown rams. Lambing commences in July, and the lambs are sold fat off the mothers in November. Little supplementary feed is necessary for the sheep, but they have frequent changes of pasture, following on behind the cows, and have access to the stubbles after harvest, also some grazing off of winter cereal crops. When conditions are favourable rape is sown on the stubble in January for drafts of store lambs bought in for fattening in the autumn, 200 such stores being fattened in a good season when feed is plentiful.

Apart from the monetary return from the small flock, pastures are benefited by the mixed stocking, and a measure of weed control, both on grassland and arable, is secured.

Labour employed permanently on the farm consists of 1 cowman and 1 teamster; additional hands are engaged at harvest time. The farm provides the livelihood of three families and produces an annual average of saleable goods as follows:—40,000 gals. of milk, 400 bus. of wheat, 15 tons of wheat straw, 15 tons of rye straw, 1,200lb. of wool, and 150 fat lambs, plus the stores fattened.

Whether the combination of a small herd of high average production (attained by supplementary feeding and good pastures) with a cropping programme of cash crops gives a greater financial return than a larger herd on the same area depending solely on permanent grassland is a subject conducive to lively debate, but there is a fairly widely held belief that the mixed farming with its due balance between crops and stock makes for more stability for the individual farmer and for a healthier system of agriculture.

The continuation by Mr. Bell of the cropping practices carried out fairly extensively around Auckland in former years may be regarded more perhaps as a signpost to the future than as an interesting relic of the past.

Acknowledgments

Thanks are due to the Soil Survey Division of the Scientific and Industrial Research Department for data in the soil map and to the Lands and Survey Department for the drawing of maps.

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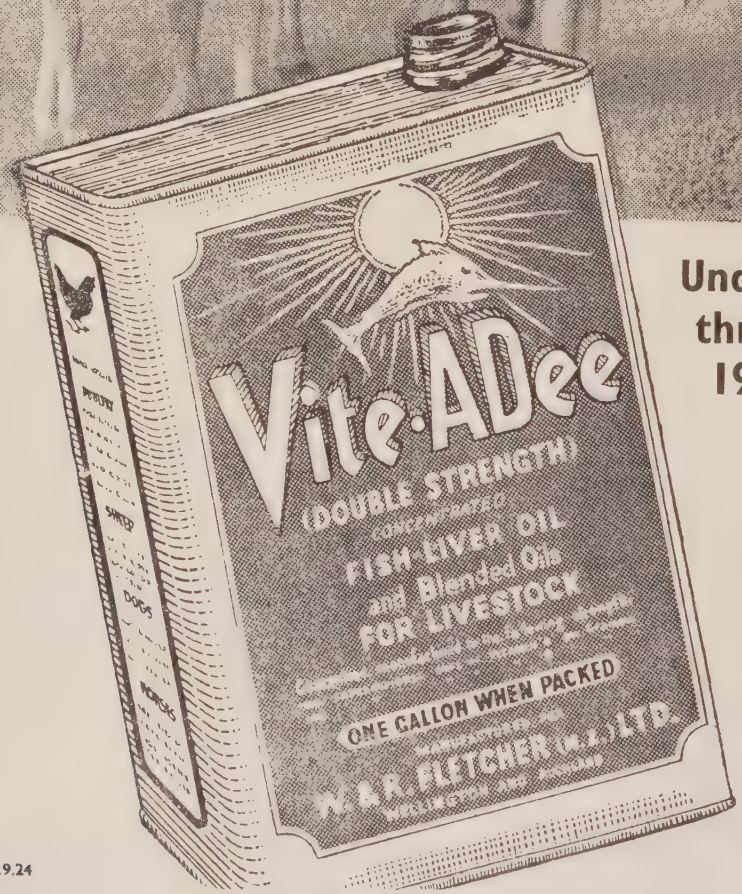
Champions — reared on Vite-ADee



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North Island Pig Carcass Competition

By H. M. PEIRSON, *Superintendent of the Pig Industry, Wellington.*

FOR many years the production of pig meats for export was little more than an idea, but it has now become an important industry. Exports to the United Kingdom began with the shipment of frozen pork carcasses some 30 years ago, and for many years pork production dominated the industry. During World War II, because of the need for bacon for the Pacific Armed Forces, the production of pigs for this purpose became a most pressing need. Today bacon represents more than half the total weight of pig meats produced and has become New Zealand's accepted breakfast meat.

From an inspection of the prize-winning entries in the recent Tomoana pork and bacon carcass competitions at Westfield, in which 3,500 pigs were exhibited, it is at once apparent that there must be a very close relation between the standards for the live pig and for the cured product. That adopted for the carcass is the predominating factor in determining the quality of the bacon placed on the breakfast table. The exhibits made it obvious that a side of prime bacon cannot be produced from an unsuitable carcass. The quality of the product to be offered to the consumer depends on the quality of the raw material.

The standards by which the competition pigs were judged were designed to pick out examples which when slaughtered will provide the desirable qualities and weights for bacon. The more completely the producer is convinced of the importance of the standard and its practical attainments through the whole process of management, the more likely he is to find the business of pig keeping satisfactory to himself and to the reputation of the country as an exporter of pig meats.

Necessity for Regulations

Competitions also give an appreciation of the necessity for the grading regulations now in operation. Grading standards, which will in future be based on the new bacon judging standards, will provide the basis for a premium to be paid for a high-quality article. The efficient pig producer will be rewarded, whereas in the past his care and skill served only to help raise the average price for his less efficient neighbour.

Despite the significance of standardisation in marketing any product, the application of the principle of grading rarely fails to bring a storm of protest. But pig carcass competitions are an excellent means of interpreting these grading standards, providing the necessary visual explanations in a way which can be understood by the producer, the manufacturer, and the consumer.

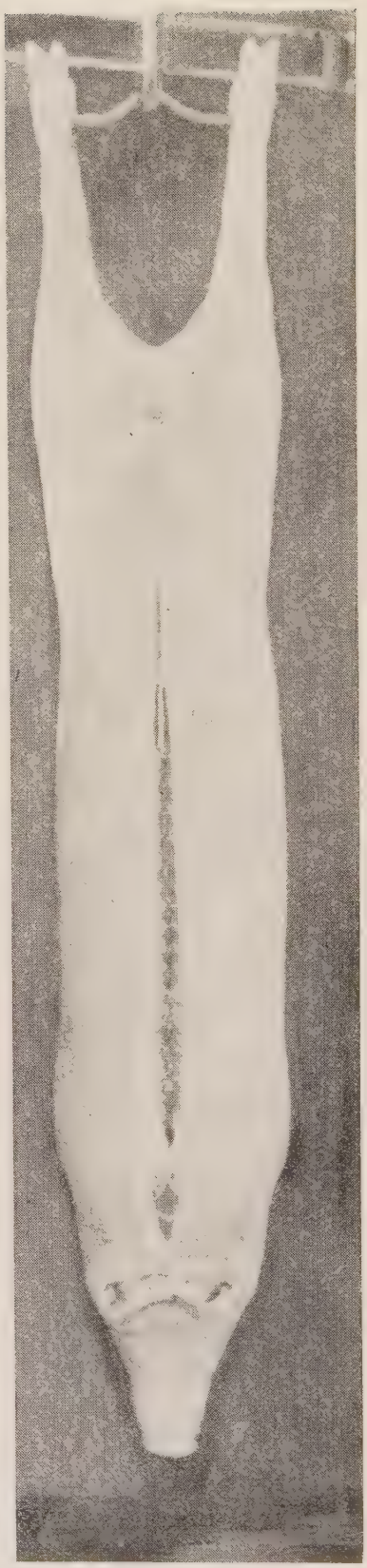
Preventable Diseases

Men qualified to deal with a particular aspect of the industry gave short talks to audiences at the competitions. Mr. W. C. Barry, Director of the Livestock Division of the Department of Agriculture, spoke on "Some Preventable Diseases of Pigs in New Zealand."

"Certain diseases and conditions occurring in pigs do not always result in serious mortality on the farm, and yet cause a serious economic loss to the pig industry," said Mr. Barry. "This loss is brought about by the infection damaging the carcass to the extent that it is either unexportable or totally condemned by the inspectors. The Meat Inspection Service, which has as its primary objects a public health function and certification of our meat products for export, is also a valuable means of assessing the incidence of disease in stock. The subject of prevention of disease in pigs is a most hackneyed one; the majority of pig farmers must have heard reference to it so frequently that it probably tends to become tiresome. It must be readily admitted, however, that the object is very important and that the continuous advice given is fully justified.

Service to Breeders

"Of recent years the District Pig Councils, through their local supervisors, have been in close touch with farmers. Free lectures and demonstrations are regularly maintained, radio broadcasts are given, and the Department of Agriculture through the Superintendent of the Pig Industry has



A prize-winning baconer carcass.

organised an extensive instruction service. Field officers of the Livestock Division give instruction on farms in methods of improved pig management and feeding. The 'Journal of Agriculture' provides articles covering all aspects of the pig industry. 'Pig Progress,' the official organ of the New Zealand Co-operative Pig Marketing Association, regularly contains extracts from various sources on the control of pig diseases. Finally, the Tomoana porker and baconer competition, held annually for some years now at various centres, have afforded displays which must prove of immense value to the betterment of the pig industry. It is sometimes said that the New Zealand farmer is not 'pig-minded.' Clearly, the interest taken in these competitions is not indicative of that failing.

"It can be safely asserted that most pig diseases which bring about rejection of carcasses for export, and may even cause total condemnation, are preventable," continued Mr. Barry. "Prevention is mainly concerned with improved housing, shelter, and sanitation, clean pasture runs, and attention to the nutritional aspect of pig feeding.

Gratifying Results

"I referred earlier to years of reiterated efforts to obtain improved methods of pig keeping and feeding. It is gratifying to record indications of good results. Twelve years ago the proportion of pigs rejected for export because of diseased conditions in the works throughout the Auckland district was 14 per cent. That figure was reduced in the 1944-45 season to 4.97 per cent. Twelve years ago 5 per cent. of pigs were rejected for export because of the effects of pleurisy; that figure has dropped to slightly more than 1 per cent.

"Pleurisy in pigs is usually associated with pneumonia, and pigs which recover from the attacks have a thickened condition of the pleura or lining membrane of the chest. The removal of this evidence involves the stripping of the pleura, and where this is done the carcass is unexportable. Pneumonia and pleurisy in pigs are largely associated with bad and unsanitary housing, along with faulty nutrition.

Menace of Tuberculosis

"Tuberculosis is a serious menace in a herd, and when a breeder becomes aware that his pigs are being affected by tuberculosis he should take prompt action to get rid of it. The most common source of the infection is through skim-milk. An examination of the dairy herds, which will be undertaken by the Department of Agriculture, will be necessary to eliminate the source of infection. A sow with a tuberculous udder can infect her young. It is possible for pigs to become infected from tuberculous poultry. One of two things is necessary to eliminate tuberculosis from pigs: Either the cleaning up of the cows by means of a tuberculine test, or pasteurisation of skim-milk fed to pigs.

"It is, however, encouraging to record a drop in the increase of T.B. infection. During the past 5 years the number of pigs found in any way affected with T.B. throughout all the works in the Auckland district has decreased by 6 per cent.

"I would urge pig breeders to further efforts in the direction of overcoming those largely preventable rejections of pigs which take place at the works," concluded Mr. Barry. "Good work has been done, but this can be improved. Seek advice where necessary. You know the organisations which are there to help you."

Display "More Than Encouraging"

"To those of us who have been associated with pig improvement work during the past 15 years, and who have watched closely the progressive improvement in quality of pig meats, the display of porkers and baconers at Westfield today is more than encouraging," said Mr. C. P. McMeekan, superintendent of the Animal Research Station, Ruakura. "I want to congratulate exhibitors, not only on the efficiency with which they have carried out their job, but also on the enthusiasm, interest, painstaking care and attention behind the magnificent exhibit of 3000 pigs.

"It is perhaps a platitude to say that a pig, like any other animal, is a product of nature and nurture, the result of heredity and environment, or, more commonly, the combination of breeding and feeding. Yet this competition once again has this main lesson to tell. It emphasises the fact in a really striking manner. Once again the winners are pigs of the strain of Mr. H. E. Johnson, of Whangarei. No better illustration of the basic importance of breeding could be given. This strain of large whites by its consistent performance over many years would suggest that it embodies inherited characteristics for carcass quality of a high standard. That breeding has also played its equally important part is to be seen in the fact that once again the same small handful of men have carried off the honours or are well up among the leaders. I would suggest that this fact illustrates their capacity as feeders of pigs of good type.

"I have been asked to comment particularly on feeding practices in relation to carcass quality, to express in simple terms if possible the basic principles which have permitted these few fatteners to compete so effectively. To do this I want to make quite clear the fact that an animal grows in a definite and orderly fashion, and in a way that determines its ultimate quality.

Changes with Growth

"First of all, when a pig grows it does not merely get bigger. It changes its shape, its proportion of bone, muscle, and fat. Just as an adult person is not merely an overgrown child, so is a baconer pig not merely an enlarged weaner. It is a different kind of animal altogether. The main cause of the difference is the different rate of growth of the three main body tissues —bone, muscle, and fat. Bone develops first, muscle next, and fat last. This is the first principle that must be understood by every pig breeder to produce a quality pig.

"The second principle is tied to this. In a well-fed animal which grows very quickly the tissue growing most rapidly at that time will benefit most. Conversely, if an animal is underfed the tissue normally growing most quickly at that time would be penalised most.

"To put this in terms of practical pig keeping: To get a pig with a reasonable amount of bone, a maximum of muscle or lean meat, and a minimum of fat, it should be made to grow as fast as possible when young to encourage muscle growth, and then as it approaches bacon weight it should be made to grow more slowly to discourage fat growth.

"Failure to recognise this fact has led to many excellent type pigs in this competition being marked down in quality. They are too fine in the bone and have too little muscle, indicating poor growth as weaners. They carry too much fat, indicating excessive growth from the porker to the baconer stage. In other words the nutrition has been just the reverse of what it should have been.

"For best quality a pig requires good feeding in early life and a lower level of feeding later. Feed it poorly in its early stages and follow this with excessive amounts of feed later, and a middle-age spread will inevitably develop."

Standard of Measurements

Mr. P. G. Stevens, who is Lecturer in Animal Husbandry at Canterbury Agricultural College, Lincoln, and was one of the judges of the competition,

spoke on carcass quality and the judging of pork and bacon carcasses.

"This gathering, numbering considerably more than a thousand farmers and representatives of the most important animal-producing area of New Zealand, is a tribute to the realistic attitude you have adopted towards the measurements of commercial qualities in your livestock," said Mr. Stevens. "As a worker and a teacher in the field of animal production for something over 20 years, I find considerable encouragement in your acceptance of critical tests of this nature. May I express the hope that in the future there will be among livestock breeders a universal acceptance of the principles and the ideas on which such tests are based.

"Methods based on measurements to decide whether the carcass is desirable have been used in New Zealand for some 10 years, but more recently a revised standard method has been adopted. This has now been published and is available to those who wish to make themselves familiar with the details of the system.

"It is not my intention to deal with these details now, but there are some points on which I would lay stress. It is important to remember that the background idea is to translate the preference of the consumer into terms which can be of some real use to the breeder, and at the same time to standardise the method of judging so that the opinion of the individual judge is replaced by precise measurements. Before the introduction of judging by measurements, breeders relied entirely on the opinions of individual judges for a lead as to the types of animals which best filled the demands of the consumer.

"But unfortunately judges differed in their opinions, which in any case were expressed in descriptive terms of little real use to the breeder. The system which has been adopted aims at sorting out pigs of the desirable shape and composition at the most suitable weight.

"Weight is important, and there are definite market preferences for both pork and bacon. Although in this system of judging no points are awarded for weight suitability as such, due allowance is made in the assessment of other features for carcasses of undesirable weight.

Importance of Length

"The length of the carcass is one of the most important features. It is particularly important from our point of view, because though it is a strongly-inherited characteristic and one which is easy to measure, our pigs are still too short for the top grades of the export market we supply. Under this system of judging by measurement, the average pig receives only about half the possible points. This means that there is room for a considerable improvement in length of carcass, and, as it is strongly inherited, a breeding policy based on the results of measurements in these competitions is the surest way to improvement. It is noteworthy that the strain of pigs which has consistently won this competition has always scored very high points for this feature, irrespective of where or by whom they were bred and reared.

"The composition of the carcass—that is the relative amount of fat and lean which it contains—is the downfall of many competitors. This aspect has already been dealt with by Dr. McMeekan. It is sufficient for me to say that the amount of fat is very largely a reflection of feeding methods and general management, and is therefore largely under the control of the breeder.

Depth of Chest

"Another feature of main importance is the depth of the chest in relation to the length of the pig. The demand is for a carcass in which the back-line and the belly-line run parallel. In more precise terms the chest depth should not exceed two-fifths of the length of the pig.

"These features—length of carcass, thickness of loin fat and shoulder fat, and depth of shoulder—are all assessed by direct measurements and contribute three-fifths of the marks awarded for carcass qualities. The remaining features, though of major importance, do not allow of direct measurement. This necessitates the awarding of points by appraisal and inspection. Even by this method the points awarded by different judges show close agreement, very largely because of the part played by photographic standards. The features dealt with under this heading are the ham, for which a full, meaty development is demanded; the fore-end, which should be light and small in relation to the rest of the pig (roughly 70 per cent. of the carcass ought to be behind the shoulders); and the loin, which should be lengthy and showing fullness of meat, covered with the correct amount of fat.

"Increased numbers of pigs can be produced easily and quickly. Somewhat more difficult is the production of large numbers which show a high development of those features which I have outlined and which we refer to as carcass quality. To attain improvement in this direction the hooks judgment must be the basis of the breeding policy. No progressive breeder can afford to disregard the opportunity which these competitions offer as the means of applying the acid test to the quality of his stock, and no breeder can afford to ignore the results of such a test in his breeding programme."

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TURNIP AND SWEDE CROP

By J. O. WALLACE, *Fields Instructor, Dunedin.*

TURNIPS and swedes are the most widely cultivated crop in New Zealand, about 400,000 acres being grown annually. These roots are of no mean importance to the farmer, their great value being that they provide a palatable, succulent food for stock during periods when production from pasture is low.

THE origin of the turnip is obscure. It was known to the Greeks and Romans, and reference was made to it as a vegetable food and as a food for stock in agricultural writings of the first century. However, no use was made of it in Europe as a field crop for stock until towards the end of the sixteenth century. This can possibly be attributed to the warlike nature of the times; enclosed land as we know it today was non-existent, and the crop could not very well be protected from wandering animals.

The land owners of France and Holland were apparently the leaders in growing turnips for feeding to stock, and Sir Richard Weston is credited with sponsoring their more general use in England after he observed the progress the crop was making on the other side of the Channel. However, interest continued to languish and it was not until the end of the seventeenth century when Lord Townsend demonstrated its merits by successfully growing crops under field conditions at Norfolk that a noticeable interest was shown in the plant. A much keener interest, however, followed Tull's introduction of his famous system of growing the crop in drills. Before this the seed was sown broadcast, and weeding and thinning by hand labour must have been slow and costly.

The advantages of the drill system were soon recognised, not solely because of ease in cultivating the crop, but also because it could be grown on weedy land which previously had to be fallowed during cleaning operations. Strange as it might seem, Tull obtained his best results when the drills were over 4ft. apart, but it was found that in wetter districts and on heavier land, particularly in Scotland, good crops could be grown on raised ridges much closer together than those demonstrated by Tull. Eventually the width between drills was decreased to that found convenient for the operation of horse-drawn implements, which gradually became available.

By the middle of the nineteenth century the sowing of seed on raised ridges was universally adopted by farmers on wetter and heavier lands, which originated the practice followed today of sowing on the flat in dry regions and on raised ridges in wetter districts.

While the turnip would appear to be almost as "old as the hills," the swede turnip is a relatively recent addition, having been introduced to British farming in 1777. As its name implies it originated in Sweden. Farmers found the swede a decided improvement on the common turnip on account of its improved keeping qualities and

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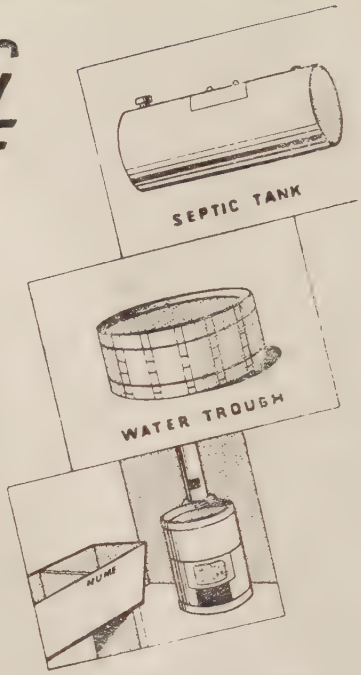

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value as a food for stock, and it soon rivalled the turnip in popularity. The degree of prominence to which the turnip rose in British agriculture following Tull's system of drilling husbandry is revealed in the acreage grown towards the close of the nineteenth century, which for the British Isles was approximately two and a-half million acres. Since then there has been a gradual decrease, but it is more than probable that what has been lost through the decrease in acreage has been counterbalanced by better production from improved strains.

Introduction into N.Z.

The early settlers who came to New Zealand from the British Isles must have appreciated the value of the turnip and brought seed with them, as the statistical records in the possession of the Otago Early Settlers' Association show that in 1849-50 a number of small areas aggregating three acres were sown by settlers in Otago. In 1852 the New Zealand Company budgeted to grow 3 acres. The seed was to be sown at the rate of 3lb. per acre, at a cost of one shilling per pound, and a yield of 20 tons per acre was anticipated. A steady increase in the area sown each year followed the development of the country, and today approximately 400,000 acres are sown annually.

Climatic Requirements

The yield of the turnip and swede crop is influenced more by climatic conditions than is generally realised. It does best when there are neither extremes of dry conditions nor heavy rain; sunshine is not important, as cool, moist conditions are preferred. Thus the crop makes its best growth during the late summer, autumn, and early winter, when the period of sunshine is reduced. As distinct from swedes, soft turnips will tolerate greater heat, so long as there is moisture in the soil sufficient for the growth of the crop. Hence in good moisture-holding soils turnips sown in December will grow on through the heat of January and February to be available by March, whereas on stiff clay soils which dry out rapidly the crop suffers badly should there be insufficient rain during these months to sustain growth.

Soil Conditions

Early ploughing is an essential feature to allow of weathering of the soil and time for the turf to decay and disintegrate. A much better admixture of the turf with the soil is thus obtained in subsequent cultivation, a most desirable feature from the point of view of plant growth and sowing operations. A fine, moist tilth is also required for even germination of the

GROWING TURNIPS AND SWEDES

A four-row scuffler.

seed and quick growth of the seedlings. This is obtained by a series of cultivations, but in the drier regions care must be taken not to overwork and cause a drying out of the top soil. This can often be avoided and the desired tilth obtained by quickly working the land when the clods have been softened by rain. In all cultivation operations before sowing the aim should be to obtain a fine, moist tilth, and it is for this reason that keen farmers make the final cultivation immediately before sowing. On the other hand it is a mistake to work the land when it is unduly wet. Consolidation of the soil is most important, and full use of the Cambridge roller should be made in achieving this state.

In some districts, particularly in the North Island, where the crop is generally sown in narrow drills by using the grain drill with turnip-sowing attachments, a method that precludes the subsequent use of implements to destroy weed growth, a desirable feature is to make the final rolling of the land some days before the intended time of sowing and to stir up the top soil with light tine or tripod harrows just before sowing. This assists consolidation of the soil and destroys masses of weed seedlings in the topmost soil which would otherwise seriously compete with the young turnip plants.

Sowing and Manuring

In the drier districts of the South Island the crop is sown on the flat in rows 7 or 14in. apart, depending on the fertility of the land. This is also the common method in the North Island. For early feeding or as a catch crop soft turnips are occasionally sown broadcast. In Otago and Southland the practice is to sow the crop on ridges 24 to 26in. apart by a special machine which sets up the ridges and at the same time sows the seed and fertiliser, the latter in two placements, with the seed and below the seed. The modern tractor-drawn machines set up four ridges at a time. It is a worth-while practice in districts where the crop is normally ridged, should dry conditions prevail, to put a roller over the ridges following sowing, as in addition to being fine, the seed-bed should be firm.

Place in Rotation

As grass is New Zealand's most important crop, there is less scope for the application of the principles of crop rotation than under more intensive arable farming. With the exception of the grain-growing areas, the practice is to keep the land in grass and when renewal of pasture becomes necessary to take the shortest procedure in getting the area back to grass after it has been broken up. However, even in regions of intensive grass farming, apart from the southern districts, the growing of turnips and swedes is fairly general, though the individual areas might be relatively small. These roots fill the place of an "in-between" crop, that is, between breaking up and resowing at a suitable period of the year, and at the same time provide valuable feed for stock during the period of the year when a feed supplementary to grass is required. In the colder and wetter districts of the South Island where roots are the principal source of winter feed the crop is invariably sown on land ploughed out of pasture the previous winter, the rotation being

swedes, oats, and the area resown with grass and rape. However, owing to the disinclination of many farmers to break up pasture, the swede area is often resown the following year with one of the disease-resistant yellow turnips. This is the general practice with, of course, modifications in districts where potatoes and other special crops are grown.

In regions where grain growing is combined with fat lamb production the grain crop is sown on land ploughed out of lea and turnips or swedes, as the case may be, following the grain crop.

These roots form a very important crop in the development of virgin land. The seed, generally soft turnips, is either broadcast or sown in narrow drills on the roughly-cultivated land, and the crop fed off in situ. Apart from the valuable supplementary feed supplied, the tramping of the animals when grazing on the roots consolidates the soil, an essential feature in the improvement of new land. Depending on the state of the soil and other aspects, two crops in succession may be taken under the circumstances.

Rate of Seeding

The rate of seeding varies depending on locality, soil type, and prevailing conditions. It approximates the following:—

Swedes: In 7in. rows (North Island), 10 to 14oz. per acre; broadcast (North Island), 16oz. per acre: in 14in. rows (South Island), 10 to 12oz. per acre; in 26in. drills (South Island), not thinned, 5 to 12oz. per acre; in 26in. drills (South Island), thinned, 12 to 18oz. per acre.

Turnips: 7in. rows, 12 to 14oz. per acre; 14in. 8 to 14oz. per acre; in 26in. ridges, not thinned, 5 to 10oz. per acre; broadcast, 32oz. per acre; broadcast with grass, 4 to 8oz. per acre.

Fertilisers

The crop responds to fertiliser, which, when possible, should be placed close to the plants. Phosphatic fertiliser is the most important and the usual practice is to apply it in a "reverted" or "basic" form. This is a mixture of superphosphate and lime processed to revert the water-soluble phosphate in ordinary superphosphate to the dicalcic or citrate soluble condition. Applied in this state there is less fear of the germination of the seed being affected as is invariably the case when straight superphosphate is sown with the seed. A mixture of one part of lime and two parts of superphosphate has been found a satisfactory fertiliser. On account of the tendency of the mixture to heat and set if left undisturbed, mixing should take place immediately before sowing and the seed added to batches of the mixture as sowing proceeds. On no account should the seed and fertiliser mixture be left for any length of time before sowing, otherwise there will be severe germination injury to the seed.

A better and safer method is to mix the superphosphate and lime on a floor some days before sowing, and, if turned occasionally in the manner of mixing concrete, the tendency for it to set is overcome. When prepared in this manner it can be safely bagged up and held until required.

The special processing by which the superphosphate is mixed with crushed magnesium-bearing rock results in the formation of a type of phosphate that can be safely sown in direct contact with the seed without the slightest fear of the germination being affected. Known as serpentine superphosphate, it has proved under trial and in farm practice to possess all the merits of reverted or basic superphosphate as a fertiliser for the turnip and swede crop. On lime-responsive soils the use of serpentine superphosphate does not cancel out the need for the application of lime.

Potash is of less importance, but organic manure such as blood and bone can be incorporated in the mixture, particularly for crops on ridge country. Nitrogenous manures in excessive quantities, however, will produce watery roots susceptible to disease and of poor keeping quality. It is also often contended that blood and bone fertiliser attracts the "fly" and for this reason should not be used.

Care of Growing Crop

Crops sown on the flat are invariably left undisturbed, but should the crop be too thick, a stroke with the harrows across the drilling is recommended.

The crop responds to cultivation and efforts taken to control weed growth in the initial stages are rewarded by heavier yields. In dealing with the ridged crop, therefore, inter-drill cultivation should begin as soon as possible, and this generally is when the plants are in the "rough" leaf, a stage of growth attained about four to six weeks after sowing. The implements should be worked close in to the rows of plants and set up to drag the weed growth to the centre of the drills. A second scuffling when the bulbs are fairly well developed is quite worth while and the plants will then, if the growth is at all vigorous, keep much of the soft weed growth in check.

Apart from the dairying districts and regions where winter fattening of cattle on swedes is an established practice, the hand thinning or singling of the crop is not general. Singling of the plants to leave them 8 or 9in. apart encourages maximum development, and yields of 50 and 60 tons per acre from thinned crops are not uncommon. The work of singling follows the initial scuffling, and when this is finished the crop should be given a second scuffling to destroy hoed-out plants that often take root and to suppress weeds.

In the districts where the crop is required principally for sheep feed singling is not considered necessary, though many farmers do single a por-

A locally-grown seed crop.

tion of their crop to obtain large bulbs required for carting off for early feeding to supplement the feed from pastures with the approach of winter. Where no singling is carried out the necessary density of plants is obtained by strictly regulating the amount of seed sown and by paying careful attention to the preparation of the land to ensure an even establishment of plants and quick growth. By this method yields of swedes from 30 to 60 tons per acre are secured.

Diseases

The two most important diseases affecting the crop are club root and dry rot. The condition known as club root is caused by a slime fungus which leaves the soil and penetrates the root tissues. In a severe attack the plant growth is arrested and the root ultimately decays.

The fungus is most persistent in slow-draining, sour land, and the first approach in effecting control is to reduce the acidity of the soil by drainage and application of lime. Lime is relatively slow in acting and more assured results are obtained when it is applied some months before sowing and mixed with the topmost soil during subsequent cultivations. In sowing affected lands the use of resistant varieties and reverted superphosphates with additional lime is advocated. In an effort to suppress the spread of the disease roots should not be fed out on grass paddocks which are likely to be used for either turnips or swede crops during the next few years.

It should not be assumed, however, that the resistant varieties are immune to disease. They should be used when it is feared that other varieties would be severely attacked. Land known to be badly affected, if it must be used to produce winter feed supplies, should be sown to one of the kales.

A search for economic control measures is continually carried out by the Department of Agriculture, and in this connection recent field trials revealed that mercuriated phosphate, obtained by processing mercuric chloride and superphosphate, gave most promising results, and the matter of having it manufactured on a commercial scale is now being investigated.

Dry rot disease can cause a great wastage in the crop as the feeding-off period advances. There is little the farmer can do other than to sow a range of varieties so that the stock move from early-maturing to late-maturing types as the season advances. Infection can spread most rapidly once it makes an appearance, and it is a good policy when it can be arranged to have the late-maturing varieties in a separate field from the early types. Swedes should never be sown in succession on the same land when it can possibly be avoided.

Varietal resistance to club-root disease.

Brown heart disease seriously impairs the quality of the roots. Its presence is a manifestation that the land is deficient in boron, and as might be expected the crop is more severely affected in some districts than in others. It can be effectively controlled, however, by the simple expedient of applying commercial borax to the land. In southern districts this is applied broadcast at the rate of 15lb. to 20lb. per acre mixed with carbonate of lime to act as a spreader and harrowed in a few days before sowing, or it may be mixed with the fertiliser and sown through the front spouts of the ridger at the rate of 5 to 8lb. per acre. This placement keeps it from immediate contact with the germinating seed.

In the North Island, where the general practice is to mix the seed with a quantity of fertiliser and sow it broadcast, a pre-application of borax at 8 to 10lb. per acre, mixed with 2cwt. of fertiliser to act as a spreader, a few days before sowing, is advocated, while applications at a higher rate have in many instances caused no detrimental effect to seed germination. Borax, however, should never be mixed with burnt lime or fertiliser mixture containing burnt lime.

Unfortunately, borax placed in close contact with the seed has a disastrous effect on the seedlings, and its placement in the soil is all-important. Many farmers get effective control using modifications of the recommendation made here, and it is suggested that a practice which under a particular set of conditions has proved satisfactory should be continued, but where effective control has not been obtained farmers should confer with their local instructor in Agriculture.

Insect Pests

Apart from diseases which concern the grower in the colder regions, the farmer in the warmer districts has to contend with damaging attacks by aphis, diamond back moth, and the brown beetle of the grass-grub. Unfortunately there are no positive control measures that the farmer can apply economically to large areas. However, with the development of modern powerful machines for the application of "dust" sprays and sprays in the form of "fog" there are distinct prospects that in the near future effective controls for such pests will be evolved.

Sensation and Vilmorin swede withstand attacks by aphis and diamond back moth better than most other varieties, and these sorts should be used in affected regions.

The brown beetle is invariably on the wing some time during November and early December. It attacks the plants during the early seedling stage of growth and rarely does it cause any damage once the plants reach the "rough" leaf. Farmers, therefore, regulate the time of sowing on their local knowledge of when the beetle will be on the wing. If turnips for early feeding are required, an endeavour is made to have these well established before the danger period, and swedes, which require cooler conditions for growth, can be sown after the danger period has passed.

The practice of using turpentine or kerosene to taint the seed still has its

NEW ZEALAND SWEDE VARIETIES

[Photo News.

followers, and it is claimed that the small seedlings from tainted seed will not be eaten off by the brown beetle. There are, however, some misgivings as to the real merits of the treatment, and it is not advocated when Government Approved seed is used, as all supplies now marketed are treated with mercurial dust preparations that protect the initial plant growth from harmful soil fungi, and to so treat the seed would result in the removal of the protecting film.

VARIETIES AND THEIR USAGES

Before the war the number of varities available—if the various names that appeared in the trade catalogues could be taken to represent varieties —were very numerous. The multiplicity of names and the new models or old models under new names that made their appearance almost annually caused the purchaser some confusion in determining the varieties most suitable for his conditions, particularly as no information was available indicating which varieties were early-maturing, main crop or late crop sorts.

In reality, however, the differences between many of the so-called varieties were very slight, and of no agronomic importance, and it was possible to separate the varieties into defined groups. Under New Zealand conditions the swede groups could be taken to represent:

"A" Early-maturing types.
"B" Main crop types.
"C" Late types.

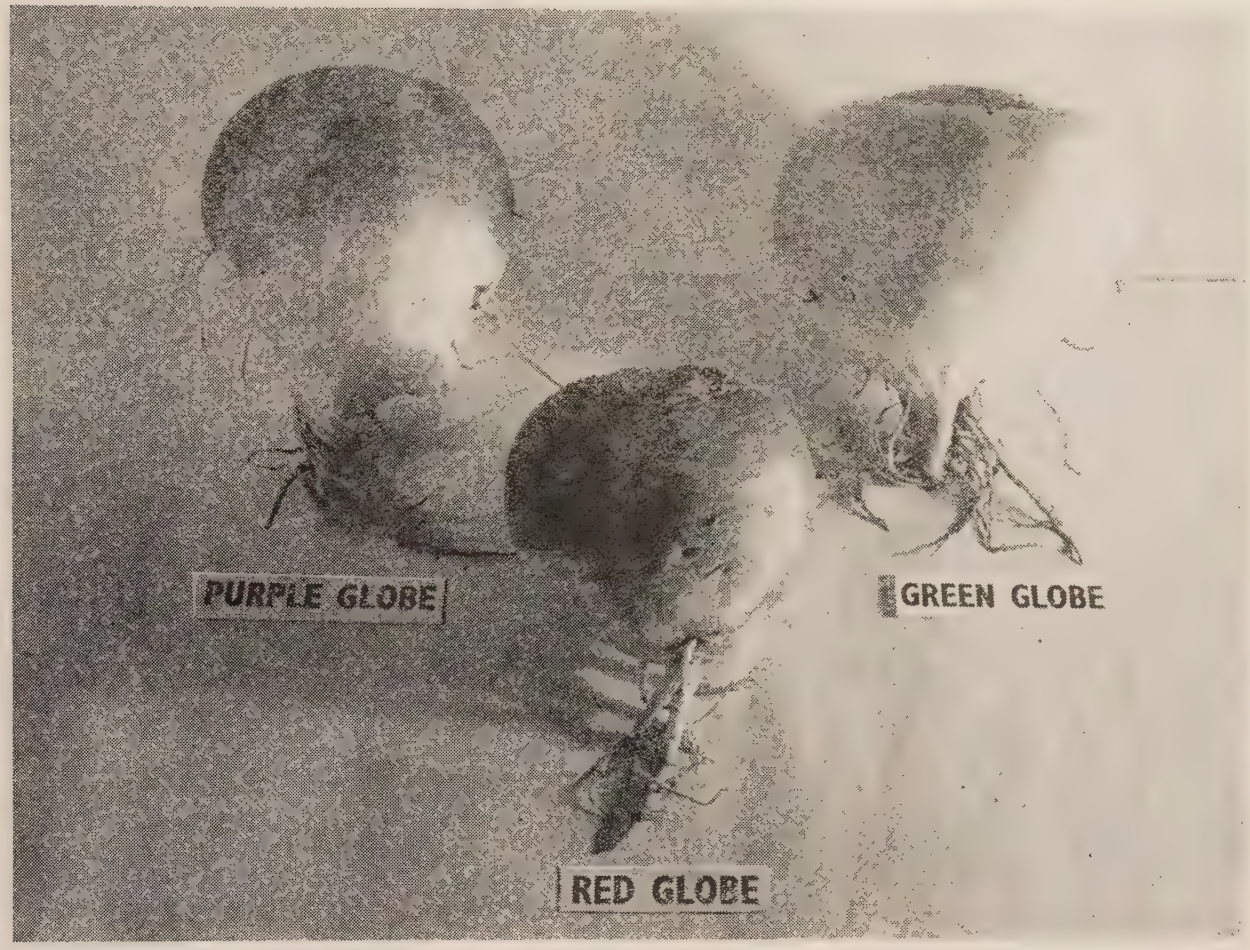
An investigation revealed the popular selling types in each group, and when war conditions made it imperative to arrange for our own requirements of seed, the most popular types in each group were used as the foundation for our selection and seed production work.

In general the bulk of the seed sold on the New Zealand market represented the "A" and "B" groups. The distinction between these two groups is not very well defined in practice owing to our relatively mild winter climate. Under more severe winter conditions the main crop types might be used to produce the early crop and some of the late varieties to produce the main crop.

Late types had a rather limited market, and this is attributed not to lack of merit, when used in their proper place, but through lack of realisation of their true merit when used in conjunction with the early and main crop types.

It was and still is to a large extent the practice to sow one variety of swede. But when the area is extensive and roots are required over a

NEW ZEALAND WHITE-FLESHED TURNIP VARIETIES



[*Photo News.*

long period such practice is not altogether to be recommended, because the late-maturing types are not suitable for the early grazing period, and the early types, because of their liability to develop disease and depreciate in quality, occasion undue wastage in the crop in late winter and early spring. It is at this stage that areas of late main crop and late crop types should be available for feeding.

N.Z. Swede Varieties

The following notes outline the general characteristics of the New Zealand produced swede varieties and the conditions under which they may be expected to do well:—

N.Z. Superlative swede: Purple top, yellow flesh—represents the early-maturing group, which includes such varieties as Superlative, Masterpiece, Success, and Magnificent. It is suitable for all swede-growing regions, but not recommended for late winter feeding in regions where severe frosty winter conditions are experienced. It yields well and the flesh is medium to soft. It is lower in dry matter than the slower-maturing types. Superlative is a popular type for market gardening purposes.

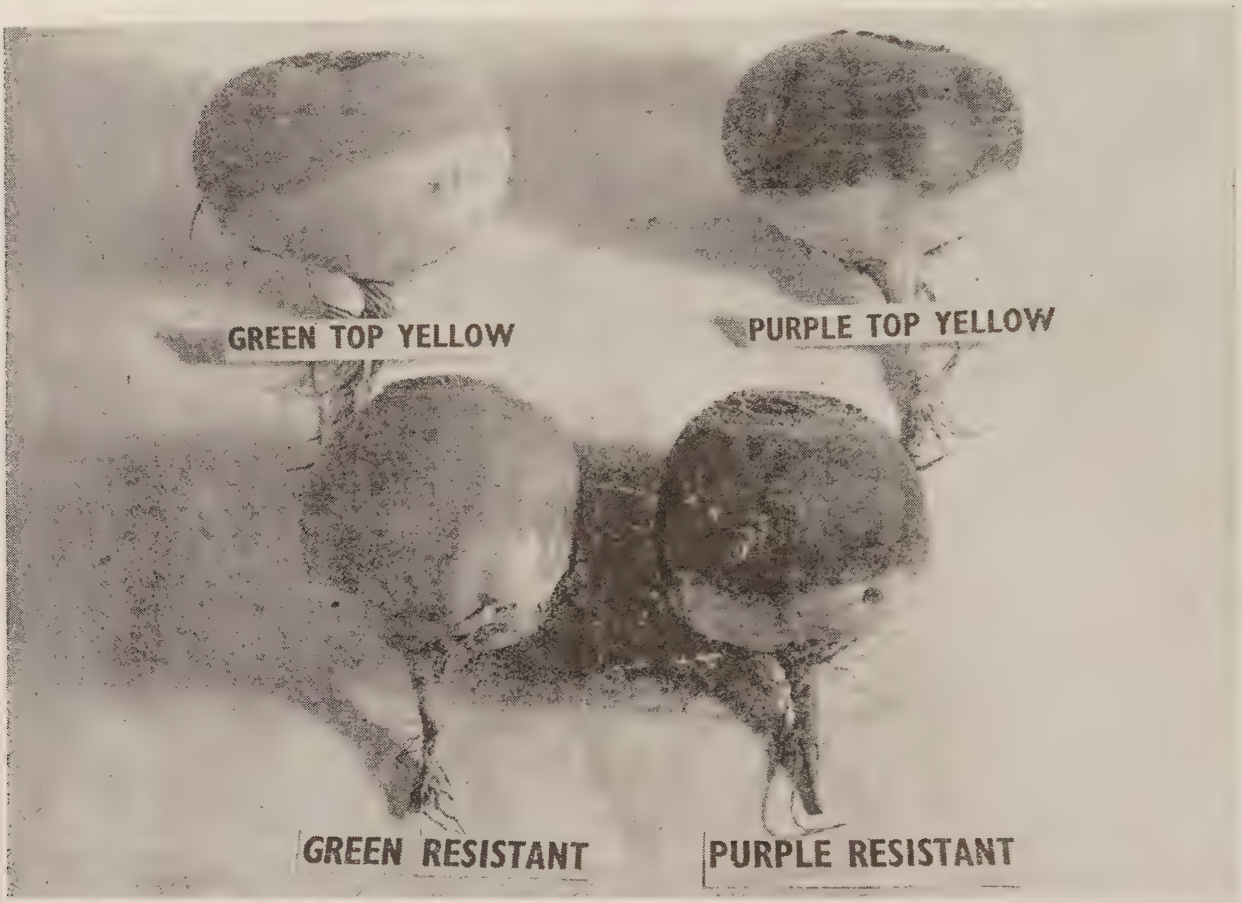
N.Z. Grandmaster swede: Purple top, yellow flesh—represents the general main crop types used in New Zealand, but the distinction between this group and the Superlative group is not well defined in practice. It is a little later maturing than Superlative and the skin and flesh are inclined to be harder. It is a popular type on the medium to rich heavy land. It continues growth later into the winter than Superlative, and is more adaptable to the colder regions. This group includes Grandmaster, Majestic, Tipperary, and Peerless.

N.Z. Sensation swede: Purple top, top, yellow flesh—represents the general main crop type. Is adaptable to an extensive range of soil and climatic conditions. The curved root is typical and in heavy crops the bulbs develop a decided lean. Crimson King, Monarch, and Elephant are all much alike.

N.Z. Sensation swede: Purple top white flesh—a main crop type and has good keeping qualities. This variety develops a long tap-root and is inclined to be fangy. It is a heavy yielder and on account of the long tap-root will outyield the stub-rooted types on the drier country. Of all the types it is the most resistant to severe damage by "blight"—aphis attack—and for this reason is popular in the humid and dry regions where aphis is to be contended with. Its popularity is rapidly increasing. Sensation is a strain of the original Vilmorin but is less fangy.

N.Z. Resistant swede: Green top, yellow flesh—represents the late crop types, practically all of which are green-topped varieties, but some incline to a bronze as they reach full maturity. It is particularly suitable for late winter and early spring feeding and adaptable to most soil types. It is not recommended for shallow, sharp land that does not retain moisture. It grows well into the winter and has excellent keeping qualities. It should be fed off during the late winter and early spring. It is a good main crop swede on better class land

NEW ZEALAND YELLOW-FLESHED TURNIP VARIETIES



[Photo News.

where hard winter frosts are experienced, as, for instance, in some of the inland regions of the southern districts. It is resistant to club root disease, but probably not to the extent of the Resistant turnips. It can quite well be recommended where club root might be suspected, but not for localities where the land is known to be badly contaminated.

N.Z. Turnip Varieties

Turnip varieties can be divided into three distinct classes:—

(a) Soft white-fleshed turnips.
(b) Soft yellow-fleshed turnips.
(c) Hard yellow-fleshed turnips.

Class (c) is generally referred to as Aberdeens. Much confusion has existed in regard to the yellow-fleshed turnip groups. Heavy crops of soft yellow and the intermediate softs are often confused with Aberdeens. The true Aberdeen has not the production of the soft yellow, but it excels in dry matter content and in keeping quality. It is a fallacy to assume that the food value per acre is in relation to the gross weight produced. The yardstick in measuring production is the amount of dry matter per acre contained in the gross weight of the roots; the balance is water.

N.Z. Purple Globe turnip and N.Z. Red Globe turnip: The former is a purple-topped, white-fleshed turnip and the latter has a red skin. Both are early-maturing types, Purple Globe being the earlier. Both can be recommended for dry districts and light poorer types of land. The Red Globe has the better keeping qualities. Both varieties are used extensively in the sowing out of new grass, and when used in this way give a change of feed to the grazing animals in the early autumn. They are useful varieties in supplying supplementary feed during the late summer and autumn as a precaution against dry weather. They are adaptable to all soil types.

Purple Globe represents Purple Top Mammoth; and Red Globe represents Lincolnshire Red and Red Paragon.

N.Z. Green Globe: Green top, white flesh—this is unquestionably the "ace" of the soft turnip varieties. The flesh is firm and the keeping qualities excellent, often rivalling the early-maturing swedes in the cooler districts. It is suitable for all but the poorest types of land. It is similar to Hardy Green Globe and Imperial Green Globe.

N.Z. Purple Top Yellow and N.Z. Green Top Yellow: Both these varieties are yellow-fleshed turnips, the former a purple-topped and the other a green-topped. Both are distinctly of the Aberdeen type. Of all the varieties of swedes and turnips these are the most difficult to grow. They are most exacting in regard to both soil and climatic conditions. The flesh is firm and bulbs of true strains should keep well right into the spring. The feed value is approximately on a par with the early types of swede. In the spring they produce a lush growth of new leafage at a time when there is little pasture growth. The dietetic properties of this new green leafage are considered by many leading farmers to make it a valuable feed for lambing ewes that have been wintered on swedes. It is for this reason that hard turnips are often grazed after main crop swedes, and stock show a decided preference for hard turnips to the early types of swede at this time of the year. Purple Top Yellow repre-

sents Purple Top Scotch and Purple Top Aberdeen, and Green Top Yellow represents Green Top Scotch and Green Top Aberdeen.

N.Z. Purple Resistant and N.Z. Green Resistant: Both are yellow-fleshed turnips; one has a purple top and the other a green top. Both are strains of hard turnips (Aberdeen types) selected for their resistance to club root disease, in which they are superior to Resistant swede. Like their counterparts they are exacting in climatic and soil conditions. They are valuable varieties where a second crop of roots following swedes must be grown, owing to their ability to resist root diseases. Hard turnips are not suitable for the lighter types of land. They require good soil and do best in cool conditions. To attain full development the plants should not be crowded in the drills. This group includes Wonowon, Bruce, and Tammie Mackie in purple-topped types and Wallace in the green-topped variety.

The soft yellow turnip group includes all yellow-fleshed turnips apart from the Aberdeens. These will grow on a greater range of country and produce larger roots than hard yellow turnips, but they are inferior in feeding value and keeping quality. The production of seed to represent this group was not given attention during the war, as it was considered the white-fleshed Green Globe variety could take its place. Types like Waites Eclipse and Fosterton Hybrid are more correctly classed as intermediate between soft yellow and hard yellow turnips. Arrangements are now under way for the production of seed of the soft yellow-fleshed type.

Utilisation

Turnips and swedes, the latter in particular, are useful vegetables for human consumption, but apart from a limited quantity used for culinary purposes the crop is fed to farm animals.

Generally the roots are fed off in situ, though it is not uncommon for small farmers, and dairymen in particular, to lift the roots and cart out a regular daily supply to the animals.

When fed off in situ the favoured practice is to concentrate the animals on limited areas known as "breaks," sufficient for seven to ten days' feeding.

Sheep on roots should at all times have free access to pasture land, and good husbandry requires that they be removed each evening and not allowed access the following morning until frost has completely disappeared. Particularly is this most important when it affects in-lamb ewes and in-calf cows.

Cattle being fattened are held close on the roots and not given the degree of run-off allowed sheep.

Supplies of good hay and salt licks should be available to the animals at all times, and should good leafy hay not be available for sheep, oat-sheaf chaff supplied in feeders makes an excellent substitute.

Milking cows should never have free access to turnips or swedes, otherwise their milk and its products will be tainted. This can, however, be overcome by regulating the allowance, and feeding immediately after milking. When used in this way turnips and swedes are a valuable addition to other feedstuffs for the dairyman.

As ewes approach lambing the amount fed should be restricted to 10 or 12lb. per day, but after lambing this can be increased to 20lb.

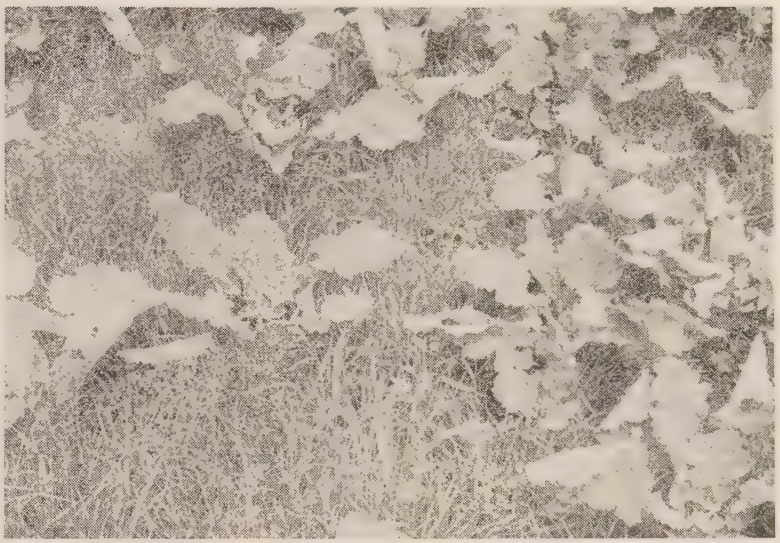
In southern districts it is common practice to fatten late lambs during the early winter on swede tops much the same as in the feeding of rape, and to prevent the animals damaging the bulbs the milk teeth are cut off with a special instrument. The number given access to the crop is limited so that, while the animals will have ample feed, the bulbs are not quickly denuded of their foliage. Utilised in this way the swede leafage provides valuable supplementary feed and the development of the bulbs is apparently not affected.

Swedes fed in amounts approximating 10lb. per day make a useful addition to the winter rations for pigs.

In general terms 20cwt. of swedes are equivalent in feed value to 25cwt. of yellow turnips or 30cwt. of soft turnips. Fattening cattle will consume about 1cwt. per day and fattening sheep about 20lb.

In the feeding of sound-mouth animals there is no need to cut up the roots, but they should be cut for aged sheep with unsound mouths; in fact, to do the animals justice, cutting is essential. There are various types of machines available for cutting the roots, but in the feeding of sheep the most satisfactory is the type that can be attached to dray or tractor trailer and operated off the axle or wheel. With such an outfit the roots can be carted out to clean pasture and chopped up, leaving the material in a narrow band at the rear of the vehicle.

TURNIPS SOWN WITH PASTURE



When sowing down a pasture a light seeding of rape or turnips provides early feed and does little harm to the pasture.

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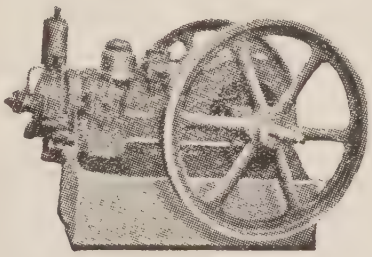

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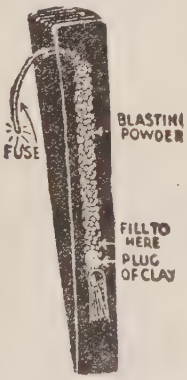

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FARM WORK FOR OCTOBER

By the Fields Division

PASTURES

Grazing of Pastures.—During the month special attention should be paid to the correct grazing of pastures to ensure that the utmost production is obtained from them and that they are utilised in the best manner. Best results are generally obtained by rotational grazing, giving the pastures spells between grazings so that they reach a maximum growth.

Harrowing of Pastures.—Cattle droppings are most easily spread when crumbly and before they become hard and embedded by growth of surrounding pasture plants. If rotational grazing is practised, the spread of the droppings at the crumbly stage is made easier, as less ground has to be covered with the harrows.

Cultivation for Grass.—Heavy soils which were ploughed in autumn in preparation for grass should now be worked down and given a second ploughing, and soon after the soil should be broken down with discs and harrows to a fine condition. A catch crop may be taken before grassing, but this is not usually in the best interests of the new pasture and is advisable only where the land is fertile enough to produce a worth-while crop. Frequently the crop delays preparation for the new grass and the sowing takes place too late for good results. Light soils should be ploughed for grassing next autumn. After ploughing, consolidation is considerably assisted by rolling on the furrow.

HAY AND SILAGE

As grass growth begins to supply the dairy cow's grazing requirements further areas should be closed for hay. As much surplus growth as possible should be saved and reserves built up for emergencies, such as the drought experienced last season. In early districts one or two fields will be ready for silage in the middle of the month. It is advisable to cut the first field for silage before the flowering stage is reached so that with the labour and facilities available more fields are cut close to the optimum stage.

LUCERNE

New Stands.—Land under preparation for sowing down to lucerne in November should be frequently harrowed to destroy weed seedlings. The ground should be limed this month and arrangements made for purchasing the seed and having it inoculated.

Old Stands.—In early districts lucerne stands will be nearly ready for cutting and a close watch should be kept on them. The first cut is better made into silage, except in low-rainfall districts where there is a reasonable chance of dry weather at cutting time.

CEREAL GREENFEEDS

In mild climates in the North Island finish the cultivation of the ground for sowing millet for feed in the summer for dairy cows and other stock. In the drier and colder districts of the South Island where oats or barley for greenfeed requires to be sown from December to February for feeding next winter, the land should be ploughed in October or earlier. Early ploughing ensures that there is a sufficient supply of moisture for the crop to establish.

Except in late districts of the maize-growing areas, sowings of maize for greenfeed should commence this month.

ROOT AND CRUCIFEROUS CROPS

In most districts the sowing of rape normally commences towards the end of this month, finishing in December. Several sowings should be made in succession to provide a continual supply of feed at the right stage of growth for the lambs. On farms where pasture seeds are sown with rape, the rape should be sown at a small quantity per acre to allow good pasture establishment.

In the North Island soft turnips sown in October will provide feed for milking cows in late December and January. It is better to sow a late-maturing and an early-maturing variety to provide a continuity of feed. In most districts the sowing of chou moellier for autumn and winter feed may commence towards the end of the month. October is the chief month in most districts for sowing sugar beet, mangolds, carrots, artichokes, pumpkins, and kumikumis for winter feed for cows and pigs. Small areas only are required for crops for pigs, and soils in good heart near pig runs should be selected. A crop of sugar beet can provide the bulk of the feed requirements of pigs in the winter, and half an acre is all that is required on most farms for this purpose.

For sowing crops with small seeds, such as turnips, chou moellier, rape, carrots, and particularly sugar beet and mangolds, a very fine and firm seed-bed is required. Where surface working does not produce fine soil, the area should be reploughed.

The depth of sowing depends on the size of the seed. Seed of crops with small seeds, such as carrots, etc., should be sown about ½in. deep, while artichokes should be planted about 3in. to 4in. deep. The so-called seed of mangolds and sugar beet should be sown just under the soil surface.

POTATOES

The main potato crop should be planted this month. Apply the fertiliser close to the sets. In dry districts the crop is better planted after the plough. In cold and wet districts the crop is better planted in ridges. The soil should be worked to a fine, deep tilth.

CEREALS AND PEAS FOR GRAIN AND CHAFF

In those districts and soils where spring sowing is satisfactory the sowing of barley should be finished early this month. Maize planting in most maize-growing districts will commence towards the end of the month. This is the chief month for sowing field peas. All crops should be sown on a fine and firm seed-bed.

STOCK

To obtain best results for fattening lambs the feed should be kept short. The pastures will now be supplying all feed requirements of stock. A watch should be kept on pastures likely to cause bloat in stock and feed flavour in the milk, and measures taken to prevent any occurrence of these troubles.

During shearing put only a few ewes through at a time so that they are separated from their lambs for as short a period as practicable. Sheep should be dagged before shearing.

Pigs will be receiving full supplies of separated milk, and little other feeding will be required.

GENERAL

Inspect hay and silage machinery, particularly the mowing machine, to see that it is in good order for the coming harvesting season. Too often a farmer finds during hay cutting that the mower is not functioning properly. Delays of this kind are frequently costly.

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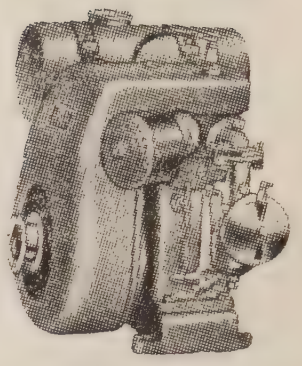

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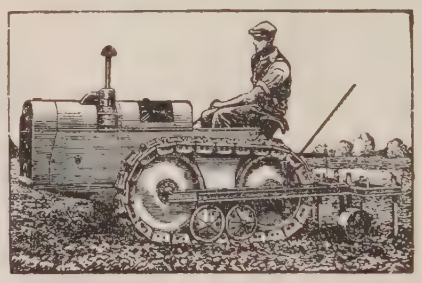

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Plan for Efficiency in the Orchard

By S. FREW, *Orchard Instructor, Blenheim.*

THIS is the time of the year for the fruit grower to take stock. Are the trees healthy and vigorous, and was the crop satisfactory during the past season? Are the varieties grown the most suited to his district, and are they all paying their way? Is the orchard developed to the maximum of efficiency, or is there still room for expansion, alteration, or invigoration? These are the questions a thoughtful fruit grower asks himself at this time of the year.

IMPROVEMENT may be effected in many ways. Of paramount importance, of course, is the growing of suitable varieties. Obviously it is not economic to prune, spray, cultivate, and manure trees of an unpopular, low-priced variety, or one which is notoriously a shy bearer in that district. Such varieties should be replaced.

Grafting and Planting

The pip fruit grower would be well advised to contemplate a long-term grafting programme with the ultimate object of eliminating all the uneconomic varieties. For this purpose grafting wood should be obtained now from desirable tree types, and to prevent them drying out the grafts should be heeled in or buried in a reasonably moist and shady position until required. When selecting the variety to be substituted, the grower should take care to allow for the spread of his harvesting season. An exaggerated flush of harvesting may cause loss of good-quality fruit through inability to cope with too many varieties at the same time.

The stone fruit grower should also review his present range of varieties, bearing in mind, for example, that many of the better-class Japanese hybrids and English plums pay dividends while some of the older varieties, though perhaps heavy croppers, are in poor demand as dessert fruit; that peaches with a stone-splitting habit are undesirable; that nectarines prone to brown rot infection are difficult to maintain in high production. The comparatively short period stone fruit trees take to come into bearing makes unnecessary short cuts to replacement such as budding or grafting; replanting is preferable.

Choice of Stone Fruits

The plum grower who considers replanting has a wide selection of high-quality varieties from which to choose.

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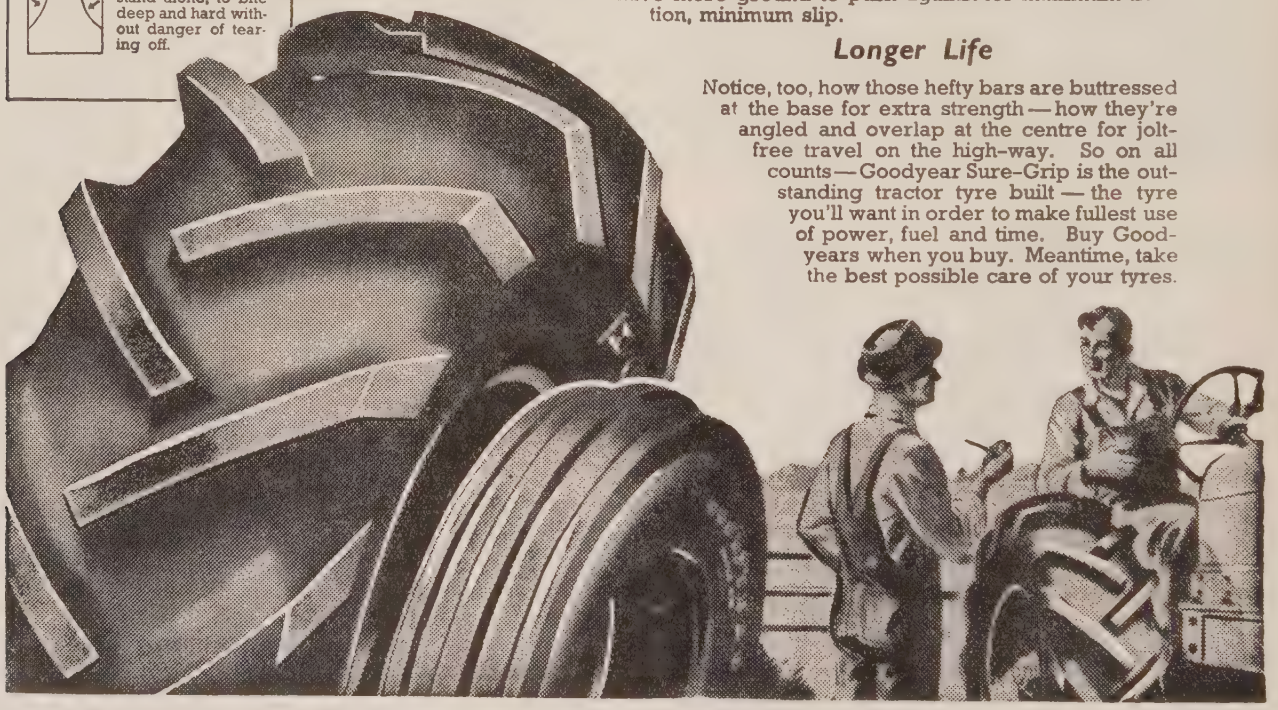

GOODYEAR

Sure-Grip O-P-E-N C-E-N-T-R-E TRACTOR TYRES

LIST A

VARIETY	PICKING DATE	DESCRIPTION
Billington's Early	Early January	Dessert and Culinary
Burbank	Mid-January	Dessert and Culinary
Doris	February	Dessert and Culinary
Duff's Early Jewel	December	Dessert
Purple King	February	Dessert and Culinary
Santa Rosa	Early January	Dessert
Satsuma	February	Dessert and Culinary
Sultan	January	Dessert and Culinary
Wilson's Early	December	Dessert and Culinary

LIST B

VARIETY	PICKING DATE	DESCRIPTION
Carmen	Mid-January	White flesh, freestone; dessert
Golden Queen	Mid-March	Yellow flesh, clingstone; dessert and canning
Hobbs' Late	Early March	White flesh, clingstone; dessert
J. H. Hale (Million Dollar)	Mid-February	Yellow flesh, freestone; dessert and bottling
Mayflower	Mid-December	White flesh, semi-cling; dessert
Paragon	Early February	Yellow flesh, clingstone; dessert and canning
Salway	Late March	Yellow flesh, freestone; canning
Ulatis	Late December	White flesh, semi-cling; dessert
Wiggins	Mid-January	White flesh, freestone; dessert

A good range of popular Japanese varieties is included in List A above.

The peach grower also has an extensive range from which to choose, and the List B above is a guide to the most popular varieties now being planted.

The most reliable variety of nectarine to grow is the Goldmine; it is a good cropper and somewhat resistant to brown rot infection. Of the apricots Moorpark is the most consistent cropper and least susceptible to frost and disease.

Importance of Stock

If planting is intended, the work should be completed as soon as possible. When selecting the trees to be planted, it is often not sufficient merely to obtain the variety required; the stock on which it is grown is also important. For example, plum trees intended for establishment on heavy land thrive on plum stock, but if they are required for planting on a sandy loam with a shingle subsoil a peach stock is preferable. As much attention should be paid to the stock as to the tree.

Replacement of trees, either by grafting or by replanting, is the first step toward orchard improvement, but the question arises whether this is sufficient. Is the orchard fully economic? Has the fruit grower all his land in production, or has he an excessive overhead in the form of partly-used equipment? If so, his property is overcapitalised, and the logical method of correction is to increase the area in fruit trees. On the other hand, if he has difficulty in handling his present area, it would perhaps be wise to eliminate the less profitable varieties and not replace them.

Spraying Programme

The orchardist with a property of economic size, planted solely in the better-class varieties, has fewer items of which to take stock. His most important questions are: Was the crop clean last season, and are the trees healthy and vigorous?

If the crop and trees were clean, there seems little need to change the spray programme, but if improved disease control is necessary a more thorough programme will have to be adopted. The first spray applied should be a dressing of red oil before growth begins at a strength of 1 part to 20 parts of water. This acts as a general clean-up to the bark, controls insect pests—particularly scale insects—and where a hard lime sulphur programme has been followed counteracts hardening of the bark. To increase penetration and improve the spread, this spray should be applied on a warm day.

As the green tips of the young growth are appearing, a foundation fungicidal spray should be applied to pip fruit. This may consist of either lime sulphur (1/30) or Bordeaux mixture 5—4—50, and is effective against diseases such as black spot, pear scab, and blister disease. Bordeaux at the same strength should be used on stone fruit when the buds begin to swell before bursting, for the control of brown rot, bladder plum, leaf curl, etc. The timely application and thoroughness of the work in applying these sprays will be important factors in the control of disease throughout the season.

Allowance should be made for varietal differences, and all varieties should be sprayed as nearly as possible at the correct times. A general spray throughout the orchard might result in some varieties being attended to much too late to achieve complete disease control.

The diseases mentioned will have wintered on or in the vicinity of the trees, and with the approach of warmer weather their activity will increase and spore discharge begin. If the spores find a place unprotected by spray they will start into growth, and an infection may be firmly established before its effect becomes apparent. Spraying should be regarded as a protection against infection and not as a cure, for only in anticipating the attack does safety lie. Disease control has not yet reached the stage when one specific will cure all the ills of trees, but modern practice has demonstrated that with reasonable care and attention clean crops are not beyond the reach of the average grower. The use of these standard specifics provides a sound foundation for a disease-free crop.

Drainage and Manuring

The remaining important point concerning the grower who is taking stock is whether the trees are thriving. Debilitation may be the result of many causes, but correction at this time of the year can be attempted in several ways. Good drainage is essential to all fruit trees, and now is the time to attend to any low-lying parts of the orchard which obviously require a field drain.

It is safe to say that on practically all soils crops are improved by the judicious application of manures. A heavy crop of fully-developed fruit depends on ample supplies of nutriment being readily available to the tree, and unless the store is maintained in the required proportions the maximum yield cannot be expected. The three most essential plant foods are nitrates, phosphates, and potash, and to ensure their full efficiency an

adequate supply of lime in the soil is necessary.

Nitrate promotes growth, and an oversupply may lead to the production of wood growth to the detriment of fruit bearing. Phosphates promote fruitfulness and in orchard practice annual applications are necessary. Potash has an influence on the quality and finish of fruit, increasing its sugar content, improving the colour, and adding to its keeping quality.

The productive capacity of the tree is governed by the minimum amount of these manures available, and no excess of one can compensate for a deficiency in the others. No definite rule for proportions or quantities can be laid down, but a fair indication can be gained from the physical condition of the tree and its performance.

General-purpose Mixture

For general purposes on bearing trees a mixture of 11 parts of high-grade superphosphate, three parts of potash (in separate form if available), four parts of sulphate of ammonia, and two parts of blood and bone will supply a well-balanced ration. It may be applied according to the condition of the tree and the nature of the soil at 3lb. a tree for a light dressing to about 8lb. for a heavy dressing. Regular applications to build up and maintain fertility are more satisfactory than spasmodic liberal doses. Applications of 1 to 2 tons of lime an acre, at intervals of 3 or 4 years, are required to correct soil acidity, particularly where a system of green manuring is followed.

For maximum effectiveness fertiliser should be applied to fruit trees before bud movement. So that the root systems may absorb the plant foods in the fertilisers in the minimum of time, the distribution of manure through the topsoil should be assisted by ploughing under the fertiliser as soon as possible, and by the maintenance of a good tilth at all times.

Pig Broadcasts

UNDER the auspices of District Pig Councils broadcasts will be delivered in October, 1946, as under:—

Auckland, 1YA, On October 16, at 7.15 p.m., "Feed Supply for Second Litters," by H. Preston, Northland District Pig Council.

Dunedin, 4YA, on October 14, at 7.15 p.m., "Winter Feeding of Pigs," by N. McDonald, Supervisor, Otago District Pig Council.

Palmerston North, 2ZA, on October 18, at 7.15 p.m., "Pigs," by L. Marsdon, Supervisor, Wellington District Pig Council.

Napier, 2YH, on October 10, at 7.15 p.m., "Answers to Questions," by H. Hopkins, Tairawhiti District Pig Council.

SHOW DATES

THE following agricultural and pastoral shows are scheduled on the dates and at the places shown:—

October 19—Ellesmere A. and P. at Leeston.

October 23, 24—Hawke's Bay A. and P. Spring at Hastings.

October 25, 26—Marlborough A. and P. at Blenheim.

October 26—Northern A. and P. at Rangiora.

October 30, 31—Poverty Bay A. and P. at Gisborne.

October 31—Ashburton A. and P. at Ashburton.

October 31, November 1, 2—Waikato A. and P. at Hamilton.

November 2—Timaru A. and P. at Timaru.

November 7, 8—Canterbury A. and P. at Christchurch.

November 8, 9—Manawatu A. and P. at Palmerston North.

November 15, 16—Wanganui A. and P. at Wanganui.

November 15, 16—Whangarei A. and P. at Whangarei.

November 16—Courtenay A. and P. at Kirwee.

November 22, 23—Nelson A. and P. at Nelson.

November 22, 23—Egmont A. and P. at New Plymouth.

November 23 — Otago Metropolitan Summer at Tahuna Park.

November 30—Winton A. and P. at Winton.

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[*Green and Hahn photo.*

STANDARD POULTRY MASHES

Scheme to Meet Feed Shortage

ALTHOUGH the decision to manufacture standard poultry mashes was made early in July, it has taken longer to organise food supplies and start manufacture than was at first visualised. Many poultry producers will therefore have heard some of the details of the present food scheme, but the number knowing the full details is probably limited. In this article F. C. Bobby, Superintendent of Poultry Husbandry, Wellington, summarises the salient points of the scheme and describes the composition and use of the mashes now being manufactured.

THE Minister of Agriculture announced on July 2 that all meals suitable for feeding to poultry, including pollard and bran, would be manufactured into standard poultry mashes. The Grain, Seed, and Produce Merchants' Federation were authorised to undertake the manufacture and equitable distribution of these mashes to all poultry producers throughout the Dominion. Although the poultry industry, through the N.Z. Poultry Board, had requested that both standard mashes and wheat should be distributed by means of a compulsory rationing scheme, it was decided that distribution should be made through normal trade channels without a compulsory scheme. The Minister stated, however, that if this method of distribution proved unsatisfactory, consideration would be given to instituting a compulsory rationing scheme.

Many comments have been made on the scheme, and it cannot be stated that standard mashes are entirely welcomed by the industry. **However, this is an emergency measure which will be maintained only while the present shortage of poultry foods lasts.** It would appear that this fact is not yet completely understood by all poultry producers. This scheme was initiated primarily to assist North Island producers, since the food shortage generally has been felt more acutely in the north than in the south. It was pleasing to note the support given to the scheme by the South Island producers, who realised how necessary it was becoming to assist poultry farmers in the north. It is also interesting to note that poultry farmers south of Canterbury have rarely seen a ready-mixed poultry mash.

Made by Licensed Firms

The mashes are being manufactured by firms licensed by the primary industries controller. These firms have been selected in all the main centres of poultry production, to give an efficient coverage and keep cartage costs to a minimum. Every bag of mash manufactured and sold must be marked either "standard laying mash" or "standard chick mash," and carry a code number indicating the source of manufacture, so that should there be any complaint regarding a mash, it can be identified.

As available supplies of bran and pollard will be directed only to licensed firms for making standard mashes, other poultry mashes previously sold will disappear from the market while the present scheme is in force. Standard mashes will be available from manufacturers, distributing merchants, grocers, and storekeepers. These mashes are intended for the

use of all poultry producers irrespective of flock size.

Price

At the time of writing prices for standard mashes have not been determined. These are being carefully reviewed by the Price Tribunal and will finally be approved after consultation with the Department of Agriculture. It is therefore not possible to comment on this aspect beyond stating that the mashes will be subject to a price varying according to district and the quantity of mash purchased at any one time.

Poultry Food Committees

Poultry Food Committees have been established at every main centre where standard mashes are to be manufactured. The function of these committees, which consist of representatives of the trade and the poultry industry, is to assist with any local problems regarding manufacture and distribution. Poultry producers experiencing difficulty in obtaining supplies or having a complaint regarding mash supplied should place the matter before the local food committee for investigation. If a producer is unable to ascertain the name and address of his representative on the district committee, he should obtain this information from the poultry instructor for his district, the secretary of the N.Z. Poultry Board, A.M.P. Buildings, Wellington, or the Department of Agriculture, P.O. Box 3004, Wellington.

Mash Ingredients

The formulas to which standard poultry mashes are to be mixed will be strictly controlled by the primary industries controller. No alterations to these formulas, except a small variation of certain ingredients in the standard laying mashes, may be made by manufacturers without written permission from the primary industries controller.

No claim is made that these mashes are complete or that they are the best possible in the light of present-day knowledge of feeding poultry. They are basically sound, but have been compounded according to the available quantity of each ingredient.

Standard Laying Mash

The bran, pollard, and wheat meal, which represent 68 per cent. of the standard laying mash, are in fixed proportions and cannot be altered by manufacturers without permission. Of the remaining ingredients, ground oats, barley meal, pea meal, and maize meal comprise 23 per cent. The proportions of these may be varied within the total of 23 per cent. as supplies of each permit, but it should be noted that any one of these ingredients must not exceed the maxima for the four alternative meals shown in the formula. Variations in the composition of this group, which represents only about one-fifth of the mash, will not affect egg production. Few manufacturers are likely to use pea meal in quantity. Only 5 per cent. of meat meal has been included, mainly because meat meal is in short supply and likely to remain so until towards the end of the year, when a revision in the amount included will be considered. Poultry farmers not using skim-milk or other food rich in protein are advised to add a further 5lb. of meat meal to every 100lb. of mash if they have supplies. Six pound of dried skim-milk powder to every 100lb. of mash would give similar results.

The 2 per cent. minerals are those usually advocated for any normal poultry mash. The 2 per cent. coarse grit has been included to render the mash unsuitable for other classes of stock. While this is probably in excess of the amount the birds will consume, its inclusion may help to conserve food supplies for the poultry industry as a whole.

STANDARD LAYING MASH

Bran	26lb.
Pollard	21lb.
Wheat meal	21lb.
Max. 15 per cent. ground oats Max. 20 per cent. barley meal Max. 10 per cent. pea meal Max. 20 per cent. maize meal	23lb
Meat meal (60 per cent. protein)	5lb.
Minerals (1 per cent. common salt, 1 per cent. limestone flour)	2lb.
Coarse grit	2lb.
Total	100lb.

STANDARD CHICKEN MASH

Bran	26lb.
Pollard	20lb.
Wheat meal	25lb.
Maize meal	20lb.
Meat meal (60 per cent. protein)	5lb.
Minerals (as for laying mash)	2lb.
Medium grit	2lb.
Total	100lb.

The ingredients and proportions have been fixed until further notice.

Standard Chicken Mash

The proportions of the ingredients of the standard chicken mash are fixed and no variation is permissible. Fibrous foods, such as ground oats and barley meal, have been excluded. An important feature of this mash is that it includes only 5 per cent. meat meal. This restriction to 5 per cent. will permit poultry farmers to add further protein foods during the first 6 to 7 weeks of the chicken's life **when a mash rich in protein is desirable.** When the chickens are past this age additional protein food (milk powder or meat meal) should be reduced until the mash **is used as a growers mash.** By this means it has been possible to avoid manufacturing and distributing an extra mash and to allow the experienced feeder to vary his additions according to his wishes and the condition of his stock. As a guide it is recommended that either 6lb. of a dried milk powder or a further 5lb. of meat meal be added to every 100lb. of mash during its use as a chicken mash in the first 6 or 7 weeks.

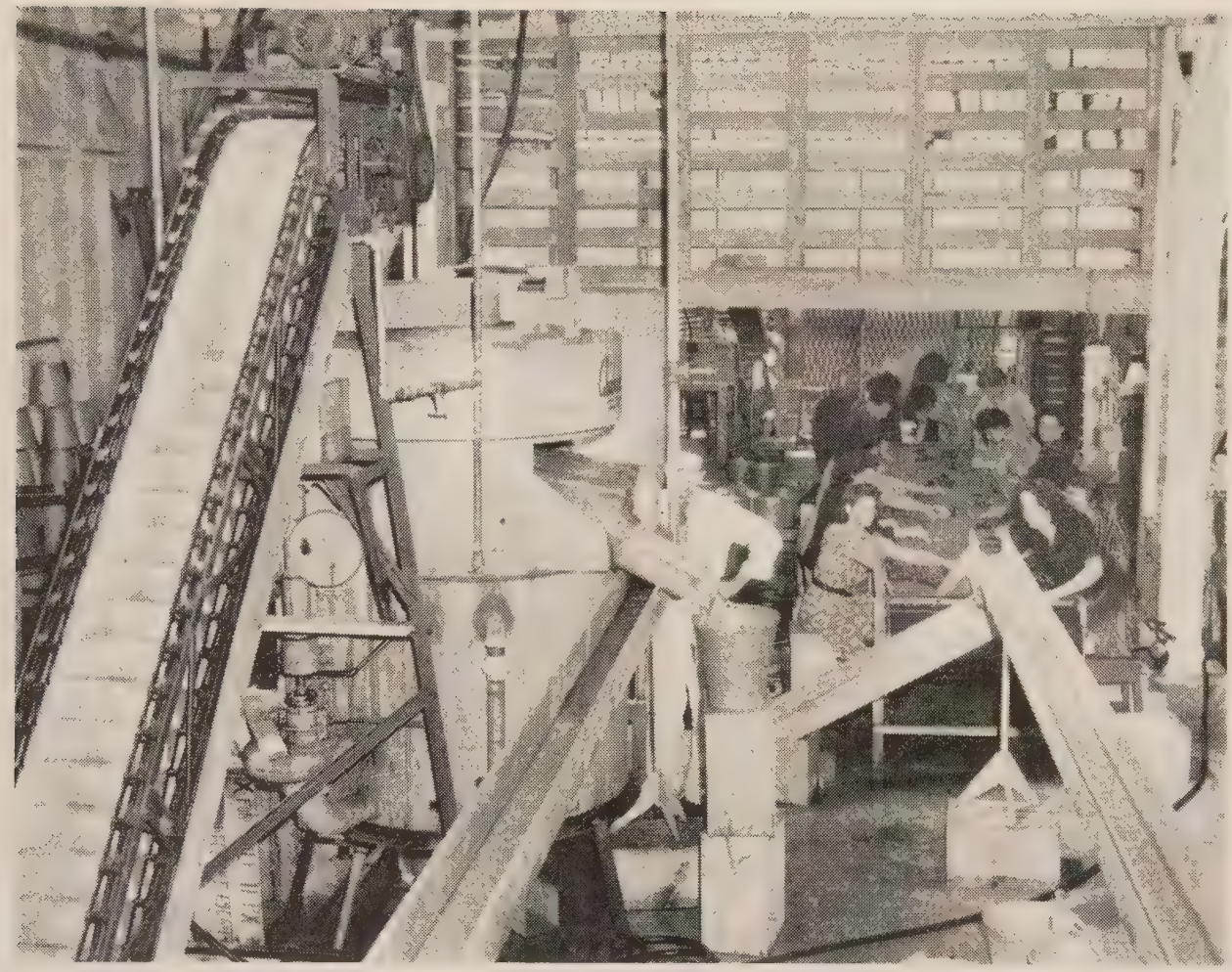
This mash contains no cod liver oil or feeding oil rich in vitamin D, and 2lb. or 1½ pints of a suitable oil should be added to each 100lb. of mash as a protection against rickets during the first 6 weeks of life, or where birds are reared intensively. Where trouble is experienced in mixing this oil into the mash, the oil may be mixed with the chick grain, providing the grain is then fed in clean troughs or, when the chickens are very young, on clean feeding boards. Oil-coated grain should not be fed in the litter or be fed in excess quantities so that the uneaten portion is allowed to remain in the troughs for long periods (12 hours or more) exposed to the air.

Any further information required may be obtained from the district poultry instructor or from the Department of Agriculture.

WEIGHTS OF STOCK FEEDS

For the feeding of fowls or other livestock where only small quantities are required a one quart tin filled, but not pressed down, will contain the following weights:

Barley	1lb. 6oz.
Bran or pollard	10oz.
Maize	1lb. 12oz.
Meat meal	1lb. 8oz.
Oats	1lb. 4oz.
Peas	1lb. 14oz.
Wheat	1lb. 14oz.



[*Sparrow Industrial Pictures photo.*

Growing Peas for "Quick Freeze" and Canning

By J. H. HITCHCOCK, *Fields Instructor, Patumahoe.*

AS part of the plan to meet the demand for vegetables for the Armed Forces in New Zealand and other parts of the Pacific area during the war, a factory covering 8 acres and operated by the Internal Marketing Division was erected at Pukekohe. The chief function of this vegetable-processing plant was the packing and crating of fresh vegetables and the dehydration of vegetables not up to standard for crating.

Two very important sidelines of this factory, however, were the "quick freeze" process of preserving vegetables, and vegetable canning. "Quick freeze," a new venture for New Zealand, is the rapid freezing of vegetables and fruits, which are then held in a frozen state until ready to be consumed.

THE objective of this method is to freeze into minute crystals the moisture that is in every cell of the food being processed. That can be done only by rapid freezing. Under ordinary refrigeration the moisture in each case freezes in the form of one or two large crystals that rupture the cell walls of the food being processed, which on thawing out becomes mush. With the minute crystals resulting from "quick freeze" there is less chance of that occurring and no damage is done to the food, enabling peas or any other processed foods to reach the table as fresh as when harvested. After the "quick freeze" process has been completed the product is held under ordinary refrigeration conditions until needed.

Lying 4 or 5 miles from this factory, the Patumahoe State Gardens grew, as part of their production schedule, peas for both the "quick freeze" and canning processes in the 1944-45 and 1945-46 seasons. In the first season 65 acres was grown, the bulk of this production being used for "quick freeze." In 1945-46 the area was 84 acres, the peas being all canned. Crops were also grown by private growers in the Pukekohe district.

Before that the Pukekohe project had grown peas only for service orders, and they were all hand picked. Those crops were always sown in 30in. rows with a corn planter, and cultivated regularly by hand hoes and tractor inter-row equipment. The seeding rate with the corn planter was 2 bushels an acre, and the average yield of peas and pods was 1½ to 2 tons an acre.

HARVESTING WITH ROUND-MOUTHED SHOVEL
ONE METHOD OF HARVESTING—SCYTHING
THE PEA BAR
HARVESTING PEAS FOR CANNING
HARVESTING WITH TRACTOR MOWER AND PEA BAR

PEAS FOR "QUICK FREEZE" AND CANNING

When 65 acres for "quick freeze" were required, several factors had to be taken into consideration before the crop was sown. The chief points were method of sowing, method of harvesting, seeding rate, and weed control. It was obvious that to obtain maximum production the seeding rate should be increased and the distance between the rows reduced.

First Season's Operations

The method and technique adopted for the first season were governed to a certain extent by the balance of the production schedule, which had already used areas ideally suited for pea production. However, 65 acres were finally selected, the soil type ranging from a heavy volcanic loam 12in. or more in depth to a clay loam of a maximum depth of 6 to 7in.

These areas, which had been broken out of lea 12 months previously, had been cropped once with either carrots or cabbages. After the harvesting of these crops the ground had been tandem disced, harrowed, and deep ploughed. Subsequent cultivation with tandem discs, harrowing, and rolling brought the ground down to a good seed-bed.

The manurial treatment adopted for the 1944-45 season was governed by supplies. At the time of sowing superphosphate supplies were rather low, but as there was already mixed a supply of blood and bone and superphosphate for cabbage and similar crops it was decided to use this mixture at the rate of 7cwt. an acre rather than to use no fertiliser at all, though blood and bone manure is not essential for the pea crop. Both fertiliser and lime were broadcast by a topdresser before the sowing of seed.

The seed was drilled in through every coulter at 3 bushels an acre, and the roller was used after seeding to consolidate the ground. A portion of the area was later harrowed with a light set of horse harrows. The 1944-45 season was exceptionally wet and in consequence the weed growth was prolific. On small areas amounting in all to 8½ acres the crop of peas was unfit for harvesting because of excessive weed growth.

Local Growers' Methods

Peas grown by the local growers for the same purpose as this crop were grown by differing methods depending on such factors as weed prevalence, acreage to be sown, and whether the land had been cropped previously or was broken out of old pasture. The areas grown by local growers usually ranged from 1 to 5 acres, with one or two up to 20 acres.

On old cropping land infested with weed peas were in general grown in rows ranging in width from 16 to 30in. The implement used for seeding this crop in was either a hand seeder or a light cultivation type of tractor with seed bins attached. That enabled continuous inter-row cultivation, without which it would not be possible to grow crops successfully on this type of land.

Peas grown on land broken out of pasture were usually sown either broadcast or with a grain drill through every coulter, similar to the method employed on the Patumahoe area. The seeding rate ranged from 2 bushels to 3½ bushels or more an acre according to the sowing method adopted.

Harvesting the Crop

Cutting and harvesting methods varied on the small areas, scythes, sharp shovels, and slashers being the implements most used. One or two men hand pulled their areas, but that practice was not popular with either growers or viner operators, as the dirt adhering to the roots made conditions most unpleasant and unsatisfactory when the vines were fed through the viners. After cutting, the vines were forked on to motor lorries and carted from the paddock into the viners.

The ordinary grass mower was used on the large areas and the pea vines either raked into windrows and loaded from there on to trucks or loaded straight from the swath.

With the large areas at Patumahoe mechanisation was looked to for economy of harvesting, and to that end a tractor mower and pea bar were used for cutting the vines.

The pea bar was much more efficient than the ordinary grass mower bar. First because the pea fingers lifted the vine from the ground, enabling a clean cut to be made; and, secondly, because attached to the pea bar were a number of trailing strips of mild steel turned up at the ends so that the vines were rolled away from the cut and left nicely placed to be picked up readily, which avoided the use of such implements as hayrakes or side delivery rakes in collecting the vines in windrows for harvesting.

Value of Mechanical Loader

For further economy in harvesting a mechanical loader was used to load the trucks. The method adopted was to attach the loader to the rear of a truck which straddled a swath. The vines being neatly rolled, no damage was done to the peas by the truck wheels, and the truck was simply driven up and down the rows and the vines fed on to it. Three men, one building and two crowing and keeping the vines away from the elevator, could comfortably load 4 to 5 tons of vines on to a truck in 45 minutes.

That method allowed harvesting to continue all day without undue hardship. The replacement of the mechanical loader by men with forks would have meant the employment of a large team working in relays. With the extreme shortage of manpower it would have been a very costly and difficult job.

Organising of Programme

The harvesting of this crop required some organisation, as the viners could cope with only a limited quantity each day. For the first season only three viners operated at the vegetable-processing plant, and it was apparent that if larger areas were to be grown, more viners would be required. For the second season, therefore, three viners were erected on portion of the Patumahoe project.

All the pea crops were grown and harvested under direction of a field officer attached to the processing plant. The whole programme was worked out on paper and every grower given planting dates for his area or areas, as planned sowing gave a better chance of continuity of harvesting. Factors such as delayed plantings because of wet weather or other reasons, and the state of the weather during the growing season, played an important part in planning the harvesting.

With the capacity of the plant as the deciding factor, very close liaison was required between the field officer and the growers to ensure that the maximum acreage could be put through each day. A normal day's delivery from the Patumahoe project to the viners was 12 loads and the maximum delivery 20 loads, being the produce of 10 acres. The distance travelled was 5 miles to the Pukekohe viners and from 1 to 3 miles to the Patumahoe viners.

Second Season

The scheduled area of the Patumahoe project for the 1945-46 season was 84 acres, and ample time was available to get the land reserved for this crop into first-class order. During the early autumn and winter the area was deep ploughed and left in the rough to fallow; that was possible because of the reduced production schedule of all vegetables. In early spring the ground was one-way disced, harrowed, and limed at the rate of

Photograph at top left on opposite page by courtesy of "N.Z. Farmer Weekly."

TRANSPORT TO CANNING PLANT

ABOVE—A GOOD LOAD NEARING COMPLETION

LEFT—REAR VIEW OF LORRY AND ELEVATOR LOADING PEA VINES.

BELOW—PEA VINES ARRIVING AT FACTORY.

1 ton an acre. Periodical top working with the one-way discs effected good aeration and control of weed growth. Just before seeding the ground was finally worked down with the discs and harrows, and rolled.

To obtain a better coverage than in the previous year an extra bushel of seed an acre was sown, bringing the seeding rate up to 4 bushels an acre. It was sown by a drill through each coulter and cross-drilled, two bushels being sown each way. Six hundredweight of superphosphate an acre was applied at the time of seeding. As in the previous year, birds took a lot of seed just at the germination stage. The only method used to prevent bird damage was to steep some pea seed in a solution of strychnine and broadcast the seed over the areas after seeding. That destroyed a few birds and kept the damage down to reasonable limits.

The ground was rolled after seeding, and more attention was paid to weed control than in the first season. The light horse harrows were used when the peas were 2 to 3in. high and again when they were 4 to 5in. high. Some areas were harrowed as many as three times. Because of a dry season and this harrowing the crops harvested that season were practically weed free. The damage done to the crop by the harrows was negligible.

Varieties Planted

The variety planted at the Patumahoe project for both "quick freeze" and canning processes was Greenfeast, which is the main variety used throughout this district, not only for processing by the Internal Marketing Division but also for other condimentors who have peas grown on contract for them and have their own viners in the district. In the first season some other varieties used extensively in the United States for "quick freeze" and canning were also grown—Thomas Laxton, Laxton's Progress, Stratagem, Gradus, and Alderman.

The following table shows the number of days from sowing to maturity of the varieties mentioned, two sowings being made at an interval of one week:—

DAYS TO MATURITY

Date of Sowing	Stratagem	Alderman	Greenfeast	Gradus	Thomas Laxton	Laxton's Progress
25/10/44	82	82	77 (a)	70	70	66
31/10/44	79	79	76 (b)	64	64	60

(a) Sown 27/10/44. (b) Sown 1/11/44.

In the 1944-45 season sowings of Greenfeast were spread from the end of August until the beginning of December. Maturity periods ranged from 116 days for the earliest sowings to 71 days, there being a steady reduction as the sowing date became later. In 1945-46 Greenfeast sowings were spread from the middle of September to the middle of November, and maturity periods fell steadily from 95 days for the first sowing to 75 days for the last.

Seasonal conditions did not seem to have a significant influence on length of maturity. For the main growing months of the 1944-45 season—October, November, December, and January—16.60in. of rain fell on the pea crop. The weather was ideal for growing, with an absence of cold drying winds, resulting in high ground temperatures. That was perhaps the chief reason why weed growth was so prolific.

The 1945-46 season was just the opposite, the total rainfall during the same 4 months being only 7.24in. The weather was unseasonable throughout, with high cold winds which greatly reduced ground temperatures compared with October and November, 1944.

The following table sets out the yields obtained from the different varieties:—

1944-45 SEASON

	Vine yield an acre (lb.)	Shelled peas an acre (lb.)	Percentage of peas to vine
Alderman	13,559	2,212	16
Greenfeast	15,040	1,914	12
Thomas Laxton	9,561	1,871	19
Stratagem	9,401	1,331	14
Gradus	7,165	768	11
Laxton's Progress	3,724	437	11
1945-46 SEASON			
Greenfeast	15,305	3,060	20

The vine yield of Greenfeast in the second season exceeded that in the first season because of the extra rate of seeding, the vines themselves being much shorter. The difference in shelled pea returns of this variety for the two seasons is explained by the fact that as the 1945-46 harvest was used for canning the peas were permitted to become more matured before harvesting. The extra rate of sowing may also have given some increased return.

Some loss was experienced in harvesting the 1945-46 crop because of the short vines. Even the ordinary grass bar did not give a clean cut because of the lodged crop, it being necessary eventually to cut the crop in only one direction.

Grading the Crop

Payment for all crops produced in the district was based on the tonnage of shelled peas. In the 1944-45 season a flat rate of £28 a ton of shelled peas was paid. In 1945-46, however, a grading system for the shelled peas was introduced, and the grades were known as fancy, choice, and standard; prices were: fancy £38 a ton, choice and standard £25.

The aim in introducing a grading system was to supply to the public a product approaching as nearly as possible to garden freshness. By grading it is possible to can the peas when they contain a minimum of starch and a maximum of sugar. Being harvested younger the finished product also has a more natural pea flavour. Over-mature peas cause the liquid to be starchy and cloudy, which spoils the finished product. They are also more inclined to have bitter skins, and the colour is not as good as that of peas harvested at the optimum stage of growth.

The marks given for grading aimed at obtaining peas firm in texture yet

[Bottom photograph on opposite page by courtesy of "N.Z. Farmer Weekly."

Radio Broadcasts

RADIO talks to farmers will be given from Station 1YA, Auckland, at 7.15 p.m. on the following dates:—

October 7—"Milking Machine Research," by W. G. Whittleston, Animal Research Station, Ruakura.

October 14 — "Is Silage Worth While?" by A. D. Mercer, Fields Instructor, Auckland.

October 21—"Tuberculosis in Farm Animals," by I. Watt, Veterinarian. Department of Agriculture, Auckland.

October 28—Young Farmers' Club session, by a representative of the Te Kuiti District Committee of Young Farmers' Clubs.

TOP — FEEDING INTO THE VINERS

MIDDLE FINAL INSPECTION BEFORE CANNING.

RIGHT—THE RETORTS.

retaining their full flavour. Naturally all growers were anxious to obtain fancy price for their crops, and the following system was adopted to ensure that all crops were harvested at their optimum stage of growth:—

The field officer was in contact with all growers, and he inspected the crops as often as considered necessary as they came close to the harvesting stage, a machine used by the processing plant and called a tenderometer being used to determine firmness. The essential parts of this machine are two moveable interlocking grids, which dovetail in the manner of the grids of a radio variable condenser. Shelled peas are placed in the cavity formed by the interlocking grids and the machine is started. The grids, which have weights to counterbalance each other, close together, and at the point where the peas are sheared through and the pressure collapses the grids automatically stop and the degree of resistance is read off the scale on the face of the machine. The greater the degree of maturity the higher the resistance and the higher the reading.

The system of grading was based on three factors—tenderometer reading, colour, and flavour.

The optimum tenderometer reading was found to be 95, and lines returning that reading were awarded maximum points. Points were lost for variation above or below that reading. So a line giving a reading of 95 was awarded 70 points, and one giving a reading of either 90 or 100 was awarded 60.

Colour is closely related to the tenderometer reading. However, immature peas (that is peas giving a low reading) are sweeter in flavour and less starchy, and accordingly scored high for this factor, while overmature peas (those with a high reading) generally were of poorer flavour. A maximum of 10 points was awarded for colour and 20 for flavour. The highest number of points that could be awarded a line was therefore 100, but 85 or more qualified for grading as fancy. The tenderometer was also used as a measure of the time to harvest. In general the reading advanced by 4 or 5 points every 24 hours, except that if rain fell overnight and the weather remained hot, the reading might advance by 10 to 12 points in the same time. On the other hand, heavy rain on an overmature crop would result in a lower tenderometer reading 24 hours later.

It was found good practice to begin harvesting when a trial sample gave a tenderometer reading of 90, thus allowing for some margin in the event of unavoidable delays. The harvesting of the crop at the right stage is so important that the grower must almost live in the paddock to obtain maximum returns.

Varieties and Returns

From the returns for the past two seasons, not only from the Patumahoe crops but also to local growers, it would appear that if this industry is to continue in the Pukekohe district some thought should be given to deciding the best variety to grow for canning. The experience of growers in Hawke's Bay is that both William Massey and Canners Perfection are better varieties for canning than Greenfeast. Apparently up to 3 tons an acre of shelled peas, with an average of 2 to 2½ tons, is the recognised return from these varieties.

Occasionally Greenfeast in the Pukekohe district is reported to have given returns similar to the Hawke's Bay figures, but it is the general opinion that it has been grown on a "big acre." Average returns during the past season were in the vicinity of 25 to 30cwt. an acre, which were considered very satisfactory.

The chief factors to be considered if an improvement in the yield of shelled peas is sought are:—

1. Variety;
2. Method of sowing and rate of seed an acre.
3. Stage of maturity at harvesting;
4. Efficiency of harvesting; and
5. Efficiency of the viners.

If an improvement in production can be effected by one or more of these factors, every endeavour should be made to do so. As the venture is comparatively new to the district, the return an acre must be attractive to induce the growers to handle the crop.

Careful records kept during the two seasons indicated that gross returns varied from £22 to £45 an acre, and that the net returns compared more than favourably with those from most other crops.

Private Grower's Experiences

This survey of the past two seasons was based on experience at the Patumahoe project only, but alongside this project are farmers who have been growing peas successfully for years. One of the largest and most successful growers in the district, Mr. J. Kidd, of Karaka, was approached, and his co-operation has made possible the relating of the practices adopted by himself and others in his district. Mr. Kidd generally grows 25 to 30 acres of peas each season, but grew 40 acres in the season just passed.

The Karaka district forms part of Franklin County and lies between Patumahoe and Papakura, extending to Manukau Harbour. The soil type is a Karaka complex silt loam with a depth of soil of 6 to 7in. Twenty-five to thirty years ago the bulk of this land was second-class scrub and fern country and could be bought for a few pounds an acre. It is undulating and ploughable, and ploughing and topdressing have brought this area into high-class fat lamb and dairying country. Large areas of peas are grown annually for a commercial canning factory.

The carrying capacity of Mr. Kidd's farm is 5 ewes as well as one beast to the acre, which is typical of the Karaka country today. The pea crop on this farm and others in the district is part of a two-year crop rotation which consists of peas for the first season, followed immediately by Italian ryegrass and peas again for the second season, which is followed by sowing down in permanent pasture.

Mr. Kidd starts to plough out of lea after the flush of lambing about mid-August. The grass pasture is considered too valuable to plough earlier to enable the soil to fallow; every bite of grass is needed. So, excepting for small areas ploughed for the earliest sowing, the main ploughing begins about mid-August and continues, weather permitting, until mid-September.

The mouldboard type is used and the depth of ploughing is 6 to 7in. or even a little less in certain areas. The disc harrows are used on top of the furrow and two to three workings are given, depending on the condition of the soil. The stiff-tine

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PEA SILAGE FOR STOCK

ABOVE — A FIRST-CLASS STACK OF PEA SILAGE.

LEFT—SHEEP KEENLY RELISH PEA SILAGE.

BELOW—FEEDING OUT TO CATTLE

cultivator is used during later stages of cultivation, generally a week or so before planting.

Rate of Sowing

Mr. Kidd is emphatic that the thickness at which the seed is sown has an influence not only on the period to maturity but also on the yield an acre; the thicker the seed is sown the shorter time will it take the crop to reach maturity.

Earlier in this article the theory was advanced that the extra bushel of seed sown to the acre was partly responsible for increased returns. Mr. Kidd asserts that this is not so and maintains that 3½ bushels an acre is the absolute maximum which should be sown. He cites an instance of a particular area which was seeded in at a low rate. By mistake the wrong cogs were used on the drill and only a little over two bushels an acre was sown. The return of shelled peas from that area was in the vicinity of 4 tons an acre. That area took 113 days to reach maturity, though other pea crops adjacent and sown at the same time were reaching maturity in 96 days. As Mr. Kidd says, conditions were ideal for that particular crop and it would not be possible to sow only two bushels an acre all the time and succeed. But he maintains that it did show that lighter sowings are preferable to heavier ones. If seed is sown too thickly insufficient air and light can circulate through the crop. As a result quite a large percentage of the pods are short and small when the crop is ready for harvesting, and these pods cannot be threshed out cleanly, with a resultant drop in production.

That would explain why the Patumahoe crop last season had a large percentage of small immature pods. If Greenfeast peas are sown at the correct rate all pods on the vine will mature together. An inspection of the Patumahoe crop last season revealed that 60 to 70 per cent. of the pods were at the optimum stage of maturity, 10 to 15 per cent. over-mature, and 20 to 25 per cent. small, short, and under-mature.

It is now obvious that increasing the rate of seeding beyond 3½ bushels an acre will not, as at first thought, increase the production of shelled peas. Officials from the processing plant also noticed that some of the crop grown for them last season had a similar percentage of over-mature and under-mature peas, and a check-up on those crops showed that the seeding rate was heavier than the average.

The usual depth of seeding is 2½in. The fertiliser used is bag for bag of superphosphate and bonedust, or 1¾cwt. of superphosphate to 1¼cwt. of bonedust, applied at 5cwt. an acre for the early sowings and 4cwt. for the later sowings.

Rolling and Harrowing

The roller is not used after the early sowing unless soil conditions permit, but is invariably used on later sowings. Harrowing for weed control after germination is an important phase, and Mr. Kidd maintains that good clean crops cannot be grown without the use of harrows. He allows the peas to grow to 3in. high before harrowing. His technique is to use heavy harrows; the weight of each leaf is 65lb., 4 leaves being used, and the harrow bar weighs 90lb. A heavy rubber-tyred tractor is used to pull the harrows, and hot sunny days are preferred for the work.

Mr. Kidd is emphatic that no damage results from this method, but points out that two very important factors must be borne in mind to avoid damage to the crop: First, the tractor must travel dead slow; secondly, the harrowing must be done across the drilling and not with the drill. Only one harrowing is given and very little damage is done to the crop.

Immediately the crop has been harrowed it is rolled with a Cambridge roller to consolidate the topsoil, which makes for ease of cutting with the mower later; loose soil tends to choke the mower.

The main weed with which Mr. Kidd has to contend on his farm is Scotch thistle, but on other farms in the district the main weeds which give trouble are red-weed, fat-hen, and nightshade. Because of this weed factor, peas are never grown on the same ground in more than two successive years.

Method of Harvesting

When to cut the crop is more or less left to the individual. Having years of experience, Mr. Kidd sends the bulk of his crop into the factory just at the stage of maturity which the local standard demands. He usually cuts his pea crop during the morning and lets it lie until late evening. At any time after 6 p.m. the peas are loaded into trucks and transported to the viner, which begins operations early the following morning, usually starting between 2 and 4 o'clock. No sweating or heating occurs in the dumped loads if loading is not started until after 6 p.m.

The harvesting technique adopted by Mr. Kidd is similar to that employed at Patumahoe in that he also uses a tractor and power mower. He finds, however, that the trailer attached to the pea bar is not as efficient as a side delivery rake, which he uses attached to his tractor by a special coupling.

In a dry season when vine growth is light the grass bar of the mower is used in place of the pea bar. Mr. Kidd invariably doubles up his windrows in light crops, and states that this is more economical, as his transport charges are a very important factor and the more rapid the loading the cheaper the cost. The majority of the pea crops in his district are transported by cartage contractors.

Ryegrass Follows Peas

Immediately the crop has been harvested the ground is worked up with one or two cuts of the tandem discs, harrowed, and sown in Italian ryegrass at 25lb. an acre. The fertiliser sown with the ryegrass is the same as that used for the pea crop—5cwt. an acre of superphosphate and bonedust sown with the seed. Because of the combination of high soil fertility caused by pea residues, fertilisers, and quick growth of Italian ryegrass this crop is ready to feed off in a very short time. The grass is usually used for fattening until late in the season; it is then used as a supplementary source of fodder for the in-lamb ewes. The value of Italian ryegrass both as a means of fattening and as a supplementary fodder for the town milk supply herds is fully appreciated in this district, and this catch crop is grown for these two main purposes.

The ryegrass is ploughed under any time after mid-August and worked down for the second pea crop. After harvesting the second crop of peas the ground is top-worked with the discs and harrows to obtain a seed-bed for grass and to control weed growth. The permanent pasture is sown in early March and the same kind of fertiliser is again used.

Vines Make Silage

The waste vine from the factory is used by Mr. Kidd to make silage, the stack illustrated containing when completed approximately 180 tons of first-class silage. Silage made from pea vines is regarded in this district as a very valuable adjunct to farming operations and figures largely in the winter feeding programme.

Mr. Kidd finds a pit more satisfactory for making silage, as stack silage is very wasteful. As all the vine has to be transported from the factory to the farm, a distance of 6 miles.

every effort must be made to obtain the maximum return from this material.

This district is susceptible to outbreaks of facial eczema, and the silage is looked on as a good safeguard against this disease. On completion of his silage with the return of the vines from his last area of peas, Mr. Kidd covers the pit with earth in an endeavour to control the temperature. Pea vines, being coarse and hollow stemmed, are full of air, and considerable weight is required to keep the temperature of the stack down. Some farmers in the district do not cover their silage pits but allow sheep to have access; they trample and consolidate the vines as they fossick over the top of the pit.

Pea silage is looked on with special favour by town milk supply farmers in the district, especially in a dry season such as that just passed, as one of the means whereby the production of their herds is kept up.

Mr. Kidd's returns show that the production from Greenfeast peas an average season is 2 tons of shelled peas an acre. Last season being dry, with resultant light crops, the average was down to 25 to 30cwt., which was comparable with the Patumahoe figures. The growing of peas for canning is looked on by Mr. Kidd as an integral part of his farm management, and he considers the monetary return from the crop is not as important as the value he receives from first-class pastures sown down after the peas. His figures of stock carried speak for themselves, and an inspection of his stock and pastures certainly bears out his contentions.

Valuable in Several Ways

It is apparent that peas grown for canning can show a return which compares favourably with those from other phases of cropping and general farming in the Pukekohe district. Experience shows that this crop is a very valuable asset, not so much to the commercial market gardener perhaps but to the man who has run-out pastures and wishes to improve them. Peas, being legumes, build up soil fertility instead of lowering it, and if the manurial treatment described in this article is given—lime and superphosphate or superphosphate and bonedust—succeeding crops must benefit. As Karaka growers' experiences proved in the past very dry season, crops such as soft turnips, swedes, or Italian ryegrass to follow after the peas pay handsome dividends.

For the man close to the factory, the vines after threshing are his for the taking away, and it was apparent last season that their value had been fully appreciated. Several stacks of first-class silage up to 5 and 6 miles from the factory bore testimony to that. The feed value of pea vines is very high and they are a source of valuable nutrients to all classes of stock.

When cabbages were grown on pea areas after the first season's crop, the favourable differences in yield and quality in comparison with cabbages grown on adjoining areas were very noticeable. After the harvesting of the peas an area was sown down in grass, and the growth and vigour were widely commented on. The area showed considerable improvement on an adjoining area sown down after the harvesting of a cabbage crop. In preparation for grass the land was disced and harrowed only, then finished off with the smoothing board and roller. Ample depth was obtained by this method of preparation.

Requirements and Advantages

For economic growing of pea crops in the Pukekohe district the following factors must be considered:—

1. **Ground free from weed.**
2. **Adequate seeding rates.**
3. **Application of adequate lime and phosphate.**
4. **Close co-operation, as in the past, between grower and field officer to obtain maximum returns.**

The chief advantages of the crop are:—

1. **Additional income for farmers.**
2. **Maintenance and building up of soil fertility.**
3. **After the crop is grown land is available in good condition for growing a catch winter fodder crop.**
4. **An economic method is provided for breaking up old pastures and resowing with best English grasses and clovers.**
5. **Vine by-products provide valuable material for first-class silage.**

Acknowledgments

Thanks are expressed to Mr. J. Kidd, Karaka, for his co-operation and the information he gave for this article, and to the officers of the Processing Plant of the Internal Marketing Division, Pukekohe, for information about grading.

BOOK REVIEW

"Soils and Manures in New Zealand"

ALTHOUGH soils and manures are of fundamental importance in New Zealand, there is a dearth of text books on these essentials of our farming industry. It is pleasing to note, therefore, that a fourth, revised, and enlarged edition of "Soils and Manures in New Zealand," by L. J. Wild, M.A., B.Sc. (N.Z.), has been printed in the New Zealand Practical Handbooks series issued by Messrs. Whitcombe and Tombs Ltd. No other New Zealand text book covers so wide a field.

Mr. Wild, at present headmaster of the Feilding Agricultural High School, was at one time agricultural chemist at Canterbury Agricultural College, Lincoln, and for many years has been keenly interested in soils and fertilisers in New Zealand. As president for 12 years of the Royal Agricultural Society of New Zealand and a member of the National Council of Primary Production, Mr. Wild had a close association with farming interests, and his book is written to give farmers and students the essential facts about soil types and manuring principles and practices in this country.

"Since the last revision great advances have been made in the manufacture of fertilisers and in our knowledge of soils in general and of the soils of New Zealand in particular and their responses to manures," the author states. "Revision of this book has therefore involved rewriting whole sections of it, although the general plan of the book has been retained. Technical terms have not been introduced unnecessarily, but I have not strained to avoid them, because with the general extension of agricultural education, scientific terms at one time unfamiliar are now almost household words."

The author acknowledges assistance given in the revision by Mr. G. H. Holford, Superintendent of Fertilisers, Department of Agriculture, and by Dr. E. B. Davies, of the Soil Fertility Research Station, Department of Agriculture.

The book deals with the abode of the plant, plant nutrients in the soil, soil fertility and principles of manuring, improvement of fertility, soils of New Zealand, how to find the manurial requirements of soils, manurial requirements of various crops, and information on varieties of fertilisers and the valuation of manures.

The new fertiliser serpentine superphosphate is favourably discussed by the author and farmers can gain much from reading this new edition, whose 176 pages are full of sound information.

Whitcombe and Tombs Ltd., 7/6.

DANGER IN GRAZING BROOM CORN MILLET

By J. E. V. SIMPSON, *Officer in Charge, Facial Eczema Research Station, Manutuke.*

IN an attempt to find a crop on which a large number of sheep could be grazed safely during the short dangerous autumn period in which sheep contract facial eczema when grazing on pastures, a series of crops has been grown in the past two summers on the Department of Agriculture's farm at Manutuke, in the Gisborne district.

AMONG those tried was Japanese millet. A neighbouring pastoralist who was impressed by the large amount of grazing which it provided during the autumn of 1945 decided to sow an area of 7 acres of this crop for his own lambs for the following season. Unable to obtain Japanese millet seed, he bought seed of Broom Corn millet, which is commonly sold for bird seed. From this was grown what appeared to be a very valuable stand of green fodder.

Five hundred lambs which were turned on to this crop on February 4, when the millet was from 8in. to 1ft. high, were mustered on February 8, when a large number were found to be showing symptoms very similar to those of facial eczema. They were badly jaundiced, and the ears, eyelids, face, and sometimes the back were swollen and inflamed. The skin lesions occurred only on exposed parts and were undoubtedly due to the skin having been rendered unduly sensitive to light. Eventually over one hundred of these lambs died, although they were removed from the crop after only five days' grazing.

Experimental lambs grazed on this crop showed symptoms as early as two days and the crop remained toxic right up to the seeding stage, which occurred in April.

Left—Japanese millet. Right—Broom corn millet.

A crop of Japanese millet sown on the Experimental Farm at about the same time and under approximately the same conditions as the Broom Corn millet was grazed by lambs and ewes at intervals from February to May without any harmful effects.

The Broom Corn millet has been shown to remain toxic after drying and a quantity of the dried leaves are being examined chemically to determine the toxic principle.

Farmers are warned of the differences between the two millets — differences which are quite obvious when the seeeding stage is reached, as is apparent from the accompanying illustration. Even in the young stage there are quite marked differences. The Broom Corn millet has a round hairy stem and is inclined to stool out more than the Japanese millet, which has a smooth stem with angular edges. Farmers who wish to sow millet for grazing should make sure that they buy the seed of Japanese millet, the botanical name of which is *Echinochloa crus galli*. The Broom Corn millet, which is usually sold only for bird seed, has the botanical name of *Panicum miliacium*. It should on no account be sown for grazing.

An article giving details for cultivation of Japanese millet appeared in the "Journal of Agriculture" of February, 1946, page 107.

Acknowledgments:

The writer is indebted to Dr. Zotov, of the Botanical Section, Department of Scientific and Industrial Research, for identifying the plants, and to Miss Adams for drawing the illustration.

Wool Secretariat to Have Branch Office in Paris

THE new Paris office being opened by the International Wool Secretariat will be part of the secretariat's programme of development in Western Europe. It will be a full branch office on the Continent and will serve France, Belgium, and Holland. Separate advisory committees will be set up for each country, and representatives of wool producers and the wool industry and trade invited to take seats and co-operate with the secretariat. The branch office in Paris will have its own premises, and will be administered by either a general secretary or a managing director.

The setting up of this full branch office on the Continent follows swiftly on a recent visit to the Continent by Dr. Edgar Booth, of Australia, chairman of the International Wool Secretariat. Dr. Booth said the secretariat had decided that the time was ripe for the development of its work on the Continent.

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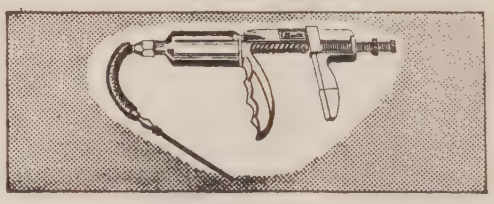

WHERE IT'S OBTAINABLE Elliott's Sulphanilamide in Oil is available through veterinarians and chemists, and only on the prescription of a Veterinarian, whom you should consult. If there is no chemist or vet. in your district, write to Premier Products Ltd., for further particulars.

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CATTLE PUMPKINS

By C. WALKER, *Instructor in Agriculture, Thames.*

WHERE climatic conditions permit the growing of cattle pumpkins, they can play an important part in the winter feeding of livestock. They are excellent feed for all classes of stock and are of considerable value in filling the gap between the tapering off of pastures as winter approaches and the maturing of swede and mangold crops. This article describes how cattle pumpkins may be grown successfully.

GENERALLY pumpkins will grow in districts where climatic conditions permit maize being grown. As this crop, like maize, is very suspectible to frost, it can be grown extensively only in the warmer parts of the North Island. Pumpkins require high-fertility soils which have excellent drainage, are fairly easily worked, and are protected from cold winds.

Preparation of Seed-bed

Early ploughing is very desirable, and on lea land this could take the form of a skim ploughing in the late autumn or early winter. This ploughing should be followed in the spring by a deep ploughing across the previous furrow. Then by the use of discs, harrows, and roller the land can be worked down to a fine and firm seed-bed. If time permits, a further deep ploughing followed by discing, harrowing, and rolling just before sowing will be found to improve yields from this crop.

Sowing and Manuring

As soon as risk from frosts is past —usually after mid-October—the crop can be sown.

The general practice is to mark the field out in "hills" from 8 to 12ft. apart each way. Two to three seeds are then dibbled in at each "hill." Such a seeding requires from 2lb. to 3lb. of seed per acre.

Before sowing it is advisable to dig in farmyard manure at each "hill." This manuring always forces the growth of the young plants. In addition, it is desirable to apply 2 to 3cwt. of superphosphate per acre, the fertiliser being applied to the "hills" rather than as a general dressing over the field.

It is important to ensure that the plants are kept growing vigorously, and that they receive no checks in development. In this respect good manuring can play an important part.

Cultivation

From the earliest stages of growth the land between the rows should be kept freely worked by periodical discing to conserve moisture and destroy seedling weeds. Some hand hoeing and weeding around plants is also helpful while the crop is establishing. Later cultivation will be restricted by runner development, but it may be continued for some time if runners are moved aside.

Cattle pumpkins on Gisborne flats.

Harvesting

In general, the crop should not be gathered until the vines have died down. Where the pumpkins are to be lifted for storage, care should be taken to avoid breaking off the stalks and so damaging the flesh, or deterioration will set in rapidly. A good dry shed should be used for storing, and bedding the pumpkins down in hay or straw will prolong their keeping powers. Where rats are troublesome it may be necessary to use fine mesh netting as a protection.

Where the crop is fed off in the field, control can be exercised by simply splitting sufficient each day to meet the requirements of stock.

Answer to Correspondent

Treating Proud Flesh

"J.M.M.," Cambridge:—

Could you advise me how to treat a lump of proud flesh on a mare's fetlock? It has been removed once, but afterwards it grew to twice its former size.

LIVESTOCK DIVISION:—

The movement of the affected part should be restricted by keeping the animal in a small paddock or loose box. Apply the following mixture twice daily by means of a fly or powder blower, taking care not to allow any to come in contact with the eyes: Permanganate of potash 1 dram, boracic acid 1 ounce, animal charcoal 2 drams.

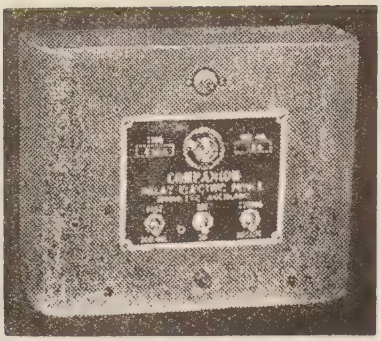
The rapid recurrence of this growth after operation may indicate that it is malignant in nature. If this is so, no treatment is likely to give satisfactory results.

Interesting Radio Talks in Print

A VERY valuable means of spreading information among members of the New Zealand Federation of Young Farmers' Clubs is the Y.F.C. radio session from station 2ZA, Palmerston North, started by the Wellington Council of the movement in 1940. This station has only a limited coverage of listeners, but so much interest has been aroused by these talks that the council has had printed a selection of 25 which were given between January, 1945, and May, 1946.

This booklet, of great interest not only to Y.F.C. members but to every farmer, may be obtained for 1s. 6d. by writing to

"Radio, Y.F.C.,
Department of Agriculture,
Palmerston North."



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LONDON, July 9
Owing to the late summer, the British grain harvest is expected to be a fortnight later this year. Reports from Agricultural areas indicate that if there is sufficient sunshine this month to ripen the wheat the yield should be 1,800,000 acres from approximately 2,000,000 acres. The acreage is substantially less than that under wheat in the war years, when the peak acreage was nearly 3,500,000

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DAIRY DIVISION

New Director is Mr. H. A. Foy

THE new Director of the Dairy Division, Mr. H. A. Foy, who succeeded to the position on August 1, has spent the whole of his working lifetime in the dairy industry. He was born at Hawera in 1901, brought up on a dairy farm, and educated at Hawera High School. Though yet a comparatively young man he has held a number of important positions.

Mr. Foy first joined the Public Service in 1917 as a cadet in the Dairy Division, but after a year decided to take up the manufacturing side as a basis for a career in the industry. From 1918 to 1925 he received training in the manufacture of dairy products in the Manutahi dairy factory in Taranaki, and from 1925 to 1932 was factory manager for the Ararata Dairy Company, also in Taranaki.

He rejoined the Dairy Division in 1932 as assistant dairy produce grader at Patea, and during the dairying seasons of 1933-34 was in charge of what became known as the Rukuhia cheese experiment. That was in effect an important series of experiments carried out at the New Zealand Co-operative Dairy Company's Rukuhia cheese factory to gain knowledge of certain problems connected with cheese quality.

In 1934 he was appointed cheese instructor for Auckland Province and held that position until 1936, when he was transferred to London as Assistant Inspector of New Zealand Dairy Products. He remained in England four years, during which time he gained valuable knowledge of the marketing and distribution of dairy products in the United Kingdom, as well as of the technical side of dairying generally. He visited Denmark, Holland, Germany, Belgium, Switzerland, and Jersey Island, and travelled extensively in Great Britain on dairy industry business. He had close association with London's Tooley Street dairy produce houses, and during the first year of the war was attached to the dairy produce quality committee which supervised dairy produce from all countries supplying the United Kingdom at that time.

After returning to New Zealand in 1940 Mr. Foy served as Cheese Instructor for the Wairarapa-Bush district until 1941, when he was appointed Supervising Dairy Produce Grader with headquarters at Wellington. From that position he was promoted to Assistant Director of the Dairy Division in 1944, and now he has assumed the directorship.

Mr. H. J. Petch Now Assistant Director

THE position of Assistant Director of the Dairy Division, which became vacant when Mr. Foy was appointed director after the retirement of Mr. G. M. Valentine, has been filled by the appointment of Mr. H. J. Petch, previously Superintendent of Butter Instruction for the Dominion, with headquarters at Hamilton.

Like Mr. Foy, Mr. Petch has spent the whole of his working life in the dairy industry. He was born at New Plymouth in 1886, and began work on a dairy farm when he was only 12 years old. His dairy factory career was begun in 1904, when he entered the employ of the Rangiwahia-Ruahine Dairy Company, and from then until 1915 he occupied various positions with dairy companies in the Rangitikei and Taranaki districts. His first mangership was with the Taihape Dairy Company in 1920.

In 1924 he was appointed to the Dairy Division as a dairy produce grader at Auckland, and the following year was transferred to Hamilton as assistant butter instructor for the Waikato and Poverty Bay districts. In 1926 he was appointed instructor to the northern half of the South Island, later taking over butter instruction work for the whole of the South Island. In 1938 he returned to Hamilton as Supervising Butter Instructor for the North Island, and was made Superintendent of Butter Instruction for the Dominion in 1944.

Mr. Petch served 2½ years on active service in France in World War I, and was in Germany for a short period with the Army of Occupation with the rank of sergeant.

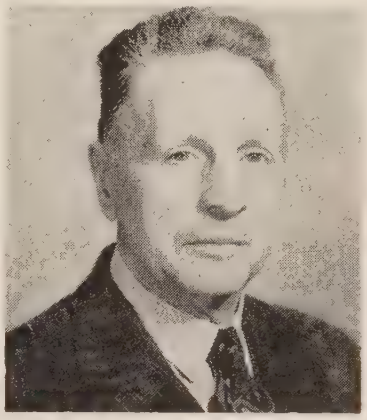
Supervisor of Herd Recording

PLANS for the extension of the Dairy Department's Certificate-of-Record and Government Official Herd Testing services have necessitated a re-organisation of the administration. As part of the necessary staffing arrangements, Mr. H. G. Philpott has recently been appointed Supervisor of Government Herd Recording.

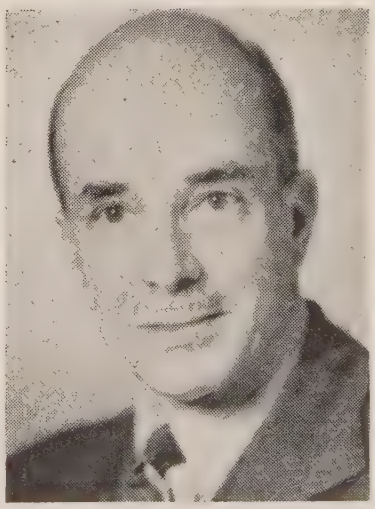
After a rural boyhood in North Taranaki and four years at New Plymouth High School, Mr. Philpott joined the Dairy Division as a cadet in 1911. Though his experience later extended to all phases of the work carried out in the division's head office in Wellington, he was from the beginning a specialist in herd testing and recording.

NEW APPOINTEES

[*S. P. Andrew photo.*
Mr. H. A. Foy.



[*Photo News.*
Mr. H. J. Petch.



[*S. P. Andrew photo.*
Mr. H. G. Philpott.

The C.O.R. test (1912) and the Government O.H.T. (1927) were both inaugurated during his service. He has served on a number of committees, and among other positions was secretary of the Herd Testing Subsidy Allocation Board (1927-29) and the New Zealand Herd Testing Central Executive (1929-36), and registrar of the Dairy Factory Managers' Registration Board from 1939 to 1946. He was appointed divisional clerk of the Dairy Division in 1939, and combined that position with Technical C.O.R. and O.H.T. Officer from 1944.

Mr. Philpott is a recognised authority on the history of the dairy industry and author of a number of articles on this subject. His book "A History of the New Zealand Dairy Industry," published in 1937, is now accepted as an authoritative work.

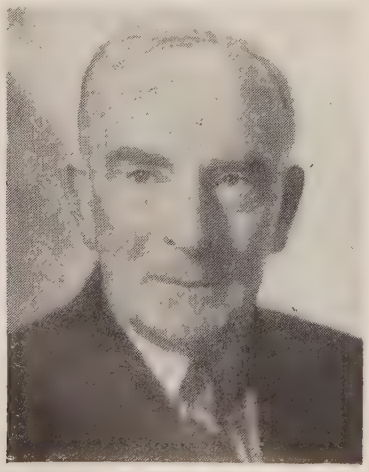
Superintendent of Grading Retires

MR. WOOD'S LONG CAREER

AFTER spending the whole of his 37 years with the Dairy Division as a dairy produce grader, Mr. E. E. C. Wood, Superintendent of Dairy Produce Grading, retired on July 31.

Mr. Wood was born in Dunedin in 1879 and began his dairy factory training in 1898 at the Waimatuku Cheese Factory, Southland, which at that time was owned and operated by Mr. Thomas Stobo, one of the outstanding cheese factory managers of his day. In 1900 Mr. Wood went to the old-established cheese factory at Waikouaiti, north of Dunedin. His first managership was in 1907 at Joseph Nathan and Company's Whakaronga factory near Palmerston North.

He joined the staff of the Dairy Division in 1909 as assistant grader at Patea, being appointed grader-in-charge of that port in 1912. About that time a grading store was opened at Castlecliff, and he had charge at that port in conjunction with Patea until it became necessary to appoint a resident grader for Castlecliff in 1924.



Mr. E. E. C. Wood.

In 1927 he was transferred to Auckland as grader-in-charge, and in 1931 and 1932, to gain experience of marketing, he assisted the Inspector of New Zealand Dairy Products in London. In 1937 he was appointed supervising grader with headquarters at Auckland, and in 1945 Superintendent of Dairy Produce Grading for the Dominion.

Though the grading of dairy produce was begun in New Zealand in 1894, the great development in the service has taken place since Mr. Wood's appointment. His responsibilities at the port of Auckland, where about three-quarters of the Dominion's exported butter and a quarter of the exported cheese is graded, have been considerable. All through his long official career he showed sound judgment and outstanding ability. His service to the industry has been of great value, and has contributed much to the success of this branch of the work of the Dairy Division.

Lifetime of Service to Farming

MR. T. E. RODDA RETIRES

ALMOST half a century of service with the Department of Agriculture ended with the retirement on June 30 of Mr. T. E. Rodda, whose name will also be familiar to readers of the "Journal" as a contributor of articles for many years. At the time of his retirement he was Fields Instructor at Hamilton.

Mr. Rodda's career with the Department began in 1898 as a farm hand on Waerenga Experimental Station (now Te Kauwhata Horticultural Station), to which he was to return more than 25 years later as manager. Apart from all classes of farm work, he was occasionally employed in the experimental orchard and vineyard, and learned pruning, grafting, spraying, and plant propagation. The year 1900 brought advancement to head ploughmen at 5s. 6d. a day, without board, for six days a week starting at 5.30 a.m., plus the feeding of about a dozen horses on Sundays, with no pay for leave or time lost because of sickness or accident. Mr. Rodda was appointed orchard and vineyard foreman in 1909, and, with shorter working hours, studied to qualify as an orchard instructor, a position which he obtained in Hamilton in 1912. His district consisted of Waikato, Waipa, Piako, Matamata, Rotorua, Tauranga, Whakatane, Opotiki, and East and West Taupo Counties. He travelled by horse and was sometimes absent from his headquarters for six weeks at a time.

In 1915 Mr. Rodda was transferred to Timaru, and worked in the district of South Canterbury and North Otago for two years. He was then appointed manager of Arataki Horticultural Station, Hawke's Bay, a 50-acre area devoted solely to experimental work in fruit-growing, grape-growing, and raising vines for sale. By 1922 the Department considered that the station had served its purpose, and the area was cut up for closer settlement. Mr. Rodda then returned to Hamilton to work in a portion of the district to which he had been appointed 10 years earlier. He remained there till 1924, when he went back to Te Kauwhata Horticultural Station as acting manager. In 1932 he became manager and superintendent of the Ruakura Farm Training College.

Student training was stopped in 1939 and Ruakura became an Animal Research Station. Mr. Rodda remained as farm manager until the end of 1941, when he was called for service with the National Military Reserve. Five months later he returned to Ruakura with instructions to prepare 100 acres of the farm for the growing of vegetables for the Armed Forces. In 1943 he was appointed technical adviser to the Services Vegetable Production Scheme for the North Island, and for several months was travelling continuously in an endeavour to fulfil the production schedule for New Zealand and American Forces in the Dominion and the Pacific Islands. The area under Mr. Rodda's supervision was about 5000 acres.

With the end of the war Mr. Rodda became Fields Instructor at Hamilton. While in this position he acted as Government representative on the Primary Production Council, chairman of the Fertiliser Control Committee, chairman of the Hay and Fodder Control Committee, and Government member on the Flax Fibre Production Committee,

During his long service Mr. Rodda has seen thousands of acres that in his boyhood days were considered useless develop into rich pasture lands, and the Department of Agriculture grow from a very small and obscure organisation. He has been untiring in his efforts to improve farm and horticultural production, and his knowledge and enthusiasm for his work will be long remembered by the farmers in the districts where he was stationed, by the students he trained in the art of farming, and by his Departmental colleagues.

Selection of Sites for Apiaries

By C. R. PATERSON, *Apiary Instructor, Hamilton.*

SUITABLE small areas of land are required by all beekeepers for the establishment of home apiaries, and possibly a number of out-apiaries also, according to the number of hives kept. In choosing an apiary site, three desirable factors should be considered: Reasonable shelter from prevailing winds; the aspect of the country to allow a maximum of sunshine; and access to the apiary by motor transport where hives are kept in out-apiaries.

IT may be necessary for the beekeeper to sacrifice certain principles, and be content with areas which are made available by the owner of the land, to establish bees in favourable nectar-producing territory; but the following points should be observed, if possible:

1. Endeavour to secure a piece of land well away from main roads, but in a position to reduce truck travel over grass paddocks to a minimum or a spell of wet weather may prevent easy access to the apiary. Keeping bees near a road may be quite safe, if the beekeeper has a quiet strain of bees and always carries out hive manipulations with the least possible disturbance.
2. Unused pieces of ground are often available near rivers or streams. Many such locations are very suitable, as the apiary would be well away from the farmer's homestead and fresh water would always be available to the bees. Much water is required by bees, especially in the spring when brood-rearing is at its height, and unless a supply is readily available they may become a nuisance around nearby drinking troughs and water taps. Before placing hives on such a location, however, make sure that there is no risk from flood waters. During the past few years several apiaries have been washed away by rivers in flood.
3. Place the hives so that they will obtain a maximum of sunshine. Sunlight is always appreciated by the bees and keeps the hives free from woodlice and vermin.
4. The aspect of the land should be considered and the hives placed in an airy position to assure that fresh air is always circulating around them. Fig. 1 shows a well-placed apiary, in which consideration has been given to good water, drainage, sunshine, and shelter from strong winds. A feature of this apiary is the use made of a slight depression in the ground (in the centre of the illustration) where a truck may be backed into the bank and loaded at ground level. This eliminates much heavy lifting and assists rapid loading of the truck with supers of honey.

Fig. 1—An apiary site giving good drainage and protection from strong winds.

Shelter Can Be Too Effective

At one time a closely-sheltered apiary was considered ideal, because in rough, windy weather the bees could come out for a flight, and the beekeeper could manipulate the hives in comfort. Many beekeepers now realise that these well-sheltered apiaries are not desirable, for the following reasons:

1. In districts with an early honey flow the bees build up too rapidly, stores become dangerously reduced, and unless supplementary feeding is resorted to many hives may be lost just when the main honey flow is in sight.

Fig. 2—A well-sheltered apiary with plenty of sunlight in winter.

2. Where food is in ample supply in a normal season, the colonies build up to such strength that great difficulty is experienced in preventing the bees swarming.
3. When excessively cold winds are prevalent bees in very sheltered apiaries come out for a flight and are soon caught by these cold winds outside the apiary area. Under these conditions hives become very much reduced in bees. Colonies in more exposed or airy locations do not suffer to the same extent, as the bees make very little effort to leave the hives in cool or windy weather.
4. Lack of air circulation usually causes hive material to deteriorate more rapidly.

Apiaries on undulating country require hardly any shelter at all, as the nature of country appears to break the full force of any wind.

Bees on plains or large areas of level country certainly require some protection against the prevailing winds. Live shelter in the form of high-growing trees should not be planted too close to the apiary, or in a few years the shelter becomes a drawback instead of an advantage. Close shelter belts, if they are of a deciduous variety of tree, will give shade from excessive heat in summer, and in winter the bare branches allow ample light and sunshine around the hives.

Fig. 2 depicts an apiary which is nicely sheltered in summer, but in winter, when the photograph was taken, all hives are well exposed to the maximum of sunlight.

If hives are placed too close to shelter they are deprived of much of the day's sunshine, as illustrated in Fig. 3, a photograph taken at midday. Under such conditions bees become

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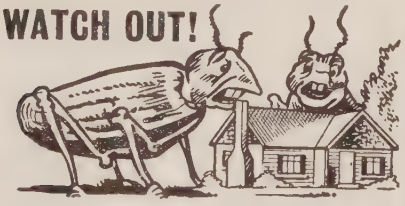

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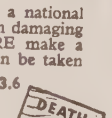

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Fig. 3—Hives placed too close to shelter.

very difficult to handle, and the beekeeper will invariably get more stings from hives in the shade than from those further out in the open.

If tree lucerne (*Tagasaste*) is planted in the apiary, it will usually grow sufficiently in three years to provide too much shade, as illustrated in Fig. 4. These trees are valuable, however, for early nectar and pollen supplies, and may with advantage be planted well back from the hives.

Method of Placing Hives

The setting out of hives in an apiary depends largely on the amount of land available. Following are methods in general use in New Zealand:

Fig. 4—Rapid growth of tree lucerne planted in the apiary gives too much shelter.

1. Where a narrow strip of land alongside a low hedge is used, it is necessary to place the hives in one long row. They can be grouped in pairs or spaced singly. This method means continual moving of the truck when loading or unloading supers, and the flying bees are inclined to drift into the end hives.
2. Where space is limited, the placing of hives in pairs in single rows appears to be the most profitable layout. A driveway can be left at the rear of the hives or down the centre of the rows.
3. Where ample space is available for all purposes the setting out of hives in groups has many advantages for the large commercial beekeeper.

Fig. 5—A motor mower is very useful in large apiaries.

4. The practice of placing hives in jumbled fashion is not as popular as it was in past years, though it is perhaps the best method of reducing drifting to a minimum. Grass is not so easily cut as where hives are in a definite row, and hive manipulation is not so readily checked. A modern method of cutting grass in large apiaries is illustrated in Fig. 5.

Fencing Desirable

During the war when fencing material was almost unprocurable many beekeepers were forced to establish apiaries on new locations without fencing. Experience has shown in some cases that few hives are tipped over during a season if the hives are placed separately with ample space between them. The majority of beekeepers, however, prefer to protect their bees against stock by erecting a fence around the hives. Fences must be properly constructed or wires soon become loose and stock find it easy to push through. The general practice is to keep the area fenced as small as possible to reduce the amount of grass growth to be dealt with.

Fig. 6—Out-apiary with drive-through gates.

Fig. 6 shows a method of fencing an apiary with a gate at each end. This enables the truck to be driven right through the centre of the apiary, facilitating the loading of surplus honey.

Summary

Commercial beekeeping depends on the beekeeper being able to place apiaries in suitable nectar-producing territory. In many instances the desire to set up an apiary in the most efficient layout cannot be fulfilled because the only location available does not allow of a model set-up for efficient management and control. In these cases a compromise layout has to be adopted which usually results in an increase in the manual work required in carrying out apiary management.

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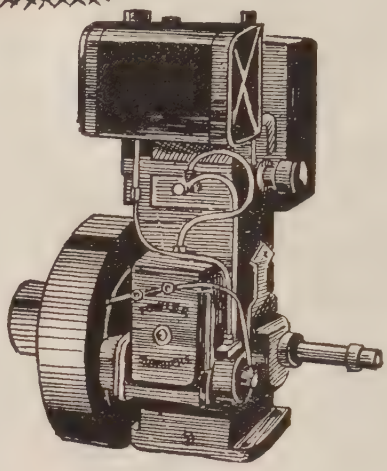

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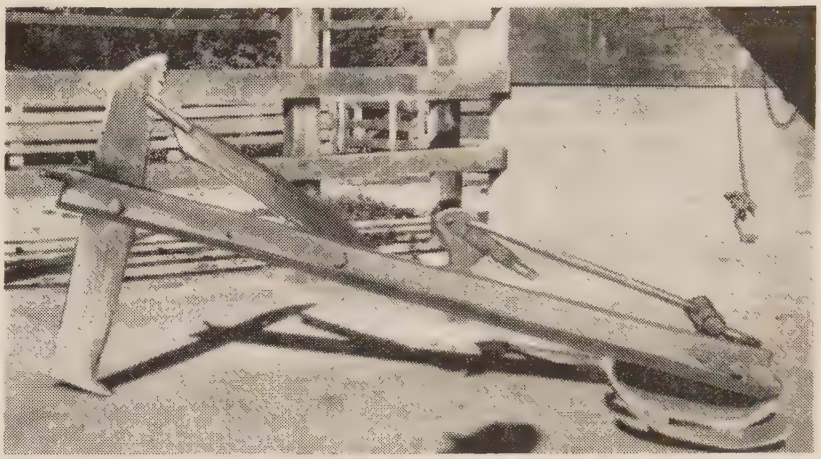
MOLE DRAINAGE

THE winter so far has been generally comparatively dry in the southern half of the North Island and over the major part of the South Island, and in those districts where the soils are suitable for mole drainage farmers have been very active during May, June, and July in getting wet paddocks, in many cases the whole farm, mole drained.



Light mole drain plough. Plug 1in. diameter; working depth 12in. to 14in.

WHILE it is right to take advantage of the relatively dry surface conditions this winter to push on with mole drainage, in doing too much of this work in the late autumn and winter a risk is incurred of very heavy or prolonged rains immediately after the pulling of mole drains causing the complete collapse of a considerable number of them. This collapse is brought about by the knife slit filling up with water which is held above the mole drain by the clay forced into the bottom of the knife slit by the plug in passing through the soil. The water gathered in the slit over the mole drain will soften this clay and also the crown of the mole drain, which collapses into the drain. This loose material is often built up by pressure of water in the drains into a complete stoppage over a considerable length of the moles.

Later in the season, in September and October, such heavy rains are not so likely to occur and for this reason many experienced mole drainers prefer to leave major mole draining work till then. The subsoil at this time is still quite moist enough, but there is more likelihood of the surface being dry, giving more tractive power to the tractor. It has been found that mole drains drawn in October generally last better than those drawn earlier in the season, though drains drawn in October have been known to collapse and become blocked when the operation was followed by two or three days of very heavy rain.

Joining Minors and Outlets

While the McLeod method of connecting up a number of minor mole drains with an outlet or major drain drawn at the same depth (this method has been described in detail in previous articles on mole drainage) is still favoured in the Wellington district by farmers wishing to do a thorough job, trials with several other methods of joining up minor or subsidiary mole drains to outlet drains to reduce the number of outlets have shown that quite satisfactory connection can be made between the minor and major drains with the method described below.

Where the operator of the mole plough can regulate the depth with some degree of accuracy, it is possible to draw the major or outlet drains first at a depth of 2½ to 3in. below the general depth at which it is intended to draw the subsidiary or feeder mole drains. These subsidiary drains are then drawn across the outlet drains with the plough pulled at just the width of the plug above the outlet drains, that is about 2½in. less depth, or 3in. where a 3in. plug is used. By pulling across the outlets at this depth the plug will just cut the tops of the previously-drawn outlets without damaging them to any extent, and in most cases the water from the subsidiary or minor drains then has direct access to the outlets. In any case an iron rod with an expanded point used as a spear where the two drains cross will soon make the necessary connection.

This method used on country with a good fall or on steeper slopes is liable to cause some scouring at the bottom of the major drains where the water falls into it from the subsidiary. However, if the relative depth of the two drains is carefully worked out and the top drains can be pulled just to cut the top of the outlet drains, very little trouble from scouring need occur. A much better connection is obtained with the McLeod method, in which the outlets and subsidiaries are drawn

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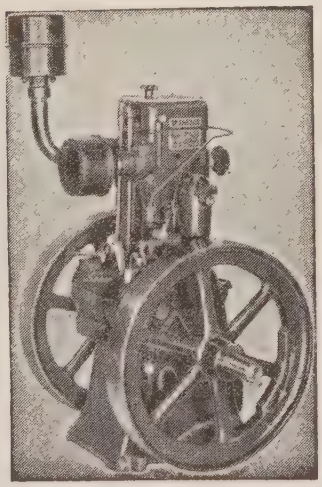

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at the same depth and the clay plug obstruction is removed between the two, giving a complete and full connection. In the suggested alternative to the McLeod method the outlets have to be planned and drawn before the subsidiary drains, which is sometimes difficult. In the McLeod method each outlet drain is drawn across after sufficient subsidiaries have been drawn.

While mole drains can be drawn immediately above drains already drawn without doing any damage to the lower drain, drains drawn to cross at the same depth or below previously-drawn mole drains are likely to damage existing drains. A plug drawn at the same depth pushes a clay obstruction into the first drain on either side, completely blocking it. When a mole is drawn below an existing drain the blade, in cutting the first drain, fills the entrance on either side with clay and the plug working below pushes up the soil into a mound in the bottom of the mole drains as it passes under them. This mound may sometimes reach to the top of the plug hole in the top drains. Care has to be exercised, then, in carrying out the work of leading subsidiary drains into outlet drains which are intended to deal with the water gathered to the point of discharge by a number of subsidiary drains.

Size of the Plug

While many favour a big plug for mole drainage, and contractors with the necessary power have pulled 4in. and 5in. plugs in stiff clays as deep as 3ft, and more, the 2½in. to 3in. plug on most mole ploughs has given good service in mole drainage throughout the country. This plug drawn at depths ranging from 15in. to 18in. has done good and lasting work on all types of land where a good moulding clay subsoil is within reach of the plough.

The big plug and heavy knife have a tendency to shatter the soil rather than mould it into a lasting drainage tube in the soil, and drains drawn with these big plugs in stiff clays have tended to break down quicker than those drawn with the smaller plug. Big plugs, even up to 7in. in diameter, have been used successfully, however, on peat and silt soils overseas.

Mr. J. H. Mason, of Reid's Line, near Feilding, found that with the 2½ to 3in. plug drawn at the usual depth on his country the mole drains did not last, because the clay at this depth was crumbly in places and did not mould well. He tried a smaller plug, and as examination of the soil showed that the best moulding clay was at depths of about 10 to 15in., he tried drawing the plug at from 12in. to 14in. Since using the small plough at these depths some three seasons ago he has made rapid progress in getting over his farm, and the mole drains appear as though they will last and they undoubtedly remove the water.

A 1in. Plug

The plug on Mr. Mason's plough, which is illustrated in this article, is now only 1in. in diameter, having worn down from 1¼in., yet it still pulls a perfectly smooth moulded hole of sufficient bore to carry a considerable amount of water. With this small plug and working at a depth of only 12 to 14in. (the latter depth in land likely to be ploughed), Mr. Mason has found that his light tractor can easily do his mole draining. The small bore of the drain is allowed for by pulling the drains from 4ft. to 6ft. apart instead of the 8ft. to 9ft. which is the usual spacing in the district when the 2½in. or 3in. plug is used.

On most country in the Rangitikei, Manawatu, Southern Hawke's Bay, and the Wairarapa where mole drainage is giving excellent results the depth of the topsoil above the clay ranges from a minimum of 4 to 6in. up to 8 to 10in., and it would appear that the small plug should do good work on almost any of this land when drawn at depths of 12 to 14in.

A trial with Mr. Mason's plough with its 1in. plug and another plough already in use in the district with a 1½in. plug was carried out this winter at Bunnythorpe, on land typical of the good mole drainage country extending from near Palmerston North, through Bunnythorpe, to Colyton and beyond. The work of these two ploughs pulling the small plugs at depths of 12in. and 14in. with the moles spaced at 4 to 6ft. is being compared with the results obtained by the standard local mole plough with a 2½in. plug drawing the moles at 16in. and spaced 8 to 9ft. apart.

The small plugs made clean smooth mole drains with less cracking around the plug hole than was the case with the large plug. All drains worked well from the start and the small drains took off the water quite well in comparison with the standard drains.

While the preliminary results with the small plugs are quite encouraging, it is intended to keep this area and others where the small plug has been used under close observation for a year or two to see how the drains last.

With these small plugs and shallow drains the light farm tractor can do the work, and even if they don't last as long as the deeper drains, and there is every reason to believe that they will, the renewal of the drains every few years will surely be one of the best paying operations that can be carried out on farms suffering from excessive wetness in the winter and spring.

Only those who have seen the remarkable change in carrying capacity in livestock and increase in crop yields effected by thorough drainage of these wet, rush-infested lands can appreciate the great value of mole drainage, and it is considered that Mr. Mason's experiments and work in developing the use of the small plug at shallow depths is a further step in the direction of getting more farmers to undertake this work of ridding the land of harmful water.

Young Farmers' Clubs

THERE are now over 250 clubs functioning in the Young Farmers' Clubs movement in New Zealand, and it is anticipated that when the annual general meeting of the Federation is held in June, 1947, 300 clubs will be operating.

Club, district, and council activities are increasing. The national Y.F.C. debating contest, revived this year after being in abeyance during the war, has progressed through the club contest stage to the inter-district competitions, and is now nearing the semi-final or inter-council stage. Teams representing the four councils are to compete—Auckland v. Wellington, and Canterbury v. Otago-Southland—and it is hoped to run the final, for the Y.F.C. debating championship cup, some time during November.

The special Y.F.C. supplement issued with the "Journal of Agriculture" to all members of the Y.F.C. organisation now replaces the Y.F.C. section formerly published in the "Journal." It comprises 16 pages, and contains many items of interest and value to Y.F.C. members—reports of club, district, and council activities and Y.F.C. Federation news generally. Non-Y.F.C. subscribers to the "Journal" wishing to have the supplement posted to them should apply direct to the **Dominion Organising Secretary, Young Farmers' Clubs, P.O. Box 3004, Wellington,** who will place them on the mailing list free of charge.

SHEARING MACHINES

Bulletin No. 234, "Shearing Machines," will be of value to shearers and farmers with their own shearing plants. It gives a detailed description of the shearing plant, and the different handpieces used in New Zealand. This bulletin will teach the shearing machine owner how to maintain and repair his plant. This bulletin is available free from the Department of Agriculture, Auckland, Wellington, Christchurch, or Dunedin.

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CASE

Citrus Budwood Needs Careful Selection

By J. E. HUME, *Orchard Instructor, Tauranga.*

THE scarcity of replacement stock of citrus trees and resultant high prices have caused some citrus growers to raise their own trees. Some have raised seedlings from Island sweet orange pips, while others have purchased yearling stocks, setting them out in nursery rows preparatory to budding during the following summer and autumn.

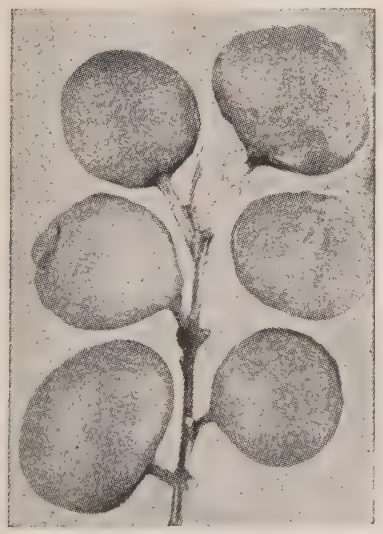
OF vital importance in the future economy of the citrus orchard, budwood should be carefully selected by the grower, and time will be well spent in selecting trees of merit from which the collection of budwood may be made. Selected trees should be mature, healthy, and well-grown and must have regularly borne heavy crops of good fruit characteristic of the variety.

As citrus trees are prone to develop "sports" or "off-type" fruits, as shown in the accompanying illustration, care should be taken during harvesting to note any variation of this kind so that when a selection is being made such trees may be avoided.

Bud Selection Committees

Citrus bud selection committees have been formed in the Auckland, Gisborne, Kerikeri, and Tauranga districts with the object of assisting the industry by having available budwood from superior strains of the main citrus varieties grown in New Zealand.

Bud selection work has already commenced and it is hoped to further this work in all districts and to have available in the near future sufficient selected budwood of standard lemons and New Zealand grapefruit for growers and nurserymen alike. The co-operation of all persons interested in this work will be appreciated. The local bud selection committee member or the district orchard instructor should be advised of any citrus trees worth observation.



Off-type Eureka lemon—to be avoided when selecting budwood.

Standard Lemon Varieties

The three main varieties of standard lemon grown in New Zealand, Lisbon, Eureka, and Villa Franca, are shown in the accompanying illustrations. Brief descriptions of each variety are:—

Lisbon (Fig. 1):

Lisbon has fruit of good quality, which is medium in size, oblong, and of good even shape. It is firm with a thin, smooth, pale-yellow rind, and has comparatively few seeds. This variety is a good cropper and produces much of its fruit in the interior of the tree. Two crops are borne each year, the winter crop being the main one. Its large thorns cause injury to fruit which comes in contact with them, and make pruning and picking operations difficult.

Eureka (Fig. 2):

Eureka fruit is of good quality, medium to large in size, oblong, and of good even shape. It is firm with a fairly thick, wrinkled, pale-yellow rind, and has comparatively few seeds. The tree is a moderate and consistent cropper and is thornless. It bears earlier than Lisbon. Fruit is borne mainly near the tips of the branches and on young trees is inclined to be coarse.

Villa Franca (Fig. 3):

Fruit of Villa Franca is of good quality, medium in size, oblong, and slightly pointed at blossom end. It has a good even shape, is firm with a thin, pale-yellow rind, and is nearly seedless. The fruit from young trees is inclined to be rough. The tree is a heavy summer bearer, a vigorous grower, and is practically thornless. The branches have shorter joints than other varieties, and for this reason Villa Franca is better suited to exposed situations. The tree is of a spreading and somewhat drooping habit.

Fig. 1.—Lisbon.

Fig. 2.—Eureka.

Fig. 3.—Villa Franca.

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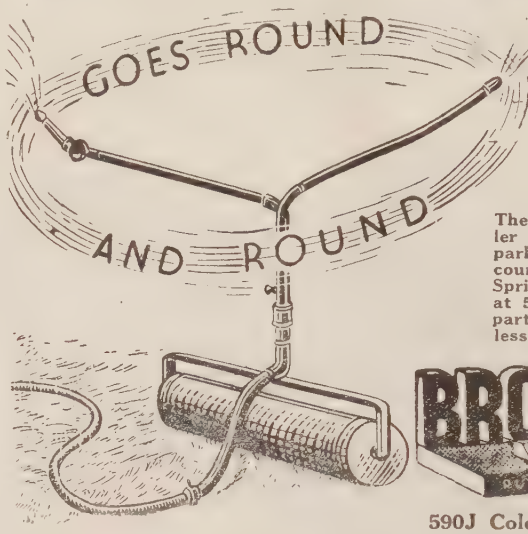

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In the Home Garden in October

By the Horticulture Division.

TOMATO plants growing in boxes in a frame or greenhouse should now be hardened off ready for planting outside. This involves giving them an increasing amount of fresh air and reducing the protection, only putting back the frame or closing the ventilators if there is a risk of frost, until the plants have become accustomed to outside conditions. Plants growing under glass tend to become soft and tender. If they were planted out in this condition they would suffer severely from a cold wind or a relatively low temperature which would have little effect on well-hardened-off plants.

When tomato plants are finally planted out, on to a site which has been properly prepared and manured, they are usually placed 12 to 14in. apart in rows 3ft. apart. Full details of the method of preparing the land are given in "Vegetable Growing in the Home Garden" (price 6d. post free from any office of the Department of Agriculture).

Melons, pumpkins, and squash: Seeds can be sown as soon as danger of frost is over. Sow 5 or 6 seeds a "hill," 6ft. apart each way, and thin out to three plants a "hill" when the plants show.

Vegetable marrows (bush type) are sown similarly, but in "hills" 3ft. apart each way.

Dwarf and runner beans may be sown any time when risk of frost is past. Seed should be sown 2 or 3in. deep and 3in. apart in a double row, later thinning plants to 6in. apart. Runner beans are usually trained on strings to a height of about 6ft. The supporting system must be really sturdy to carry the considerable weight of vines and to stand up to occasional gales. In exposed gardens it is a good plan to grow them as a low hedge, which will not need support, by nipping off the runners as they develop. A row of tall plants will cast least shade on other vegetables if it is arranged north to south.

Carrots: From now on keep a sharp look-out for aphis (green-fly) on the leaves of carrots. In a bad attack the leaves wilt, but the pest should have been noticed and controlled long before this occurs. At the first sign of green-fly (most of which will be found underneath the leaves) spray with a mixture of 1 fl. oz. of nicotine sulphate in 4 gallons of water in which has been dissolved 2oz. of soap powder.

[*Photo News.*

Runner beans can be grown as a low hedge without support by nipping off the new shoots as they appear back to about two leaves. The plants are then easy to handle but crop heavily, and they do not cast shade over other plants.

Cape gooseberries: Seeds should be sown in boxes in the early part of the month and brought on in a frame or glasshouse. Prick out the seedlings as for tomatoes to provide plants for putting out when risk of frost is past. Each plant will require about 9 sq. ft. of ground to develop properly.

Value of Cultivation

There has been some discussion lately about the value of hoeing. Experiments carried out in both America and England are being quoted as showing that frequent cultivation is not worth while.

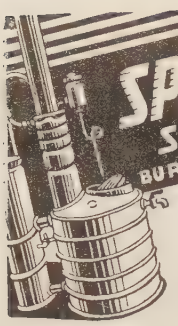
It is true that in certain fully-authenticated trials hoeing has not led to increased yields, but only in certain types of friable soil and where no weeds were present. Gardeners can be assured that the regular use of the hoe will still pay a handsome dividend by conserving moisture and reducing cracking in the soil (which causes serious damage to root systems), by killing weed seedlings and making conditions unsuitable for more weed seeds to germinate, and by warming and aerating the surface layers of the soil.

The observant old gardener who said "The proper time to kill a weed is before most people even notice it is there" spoke a truth that should be impressed on all young gardeners, who should learn to recognise the difference between the newly-emerged seed leaves of crop and weed plants.

SOW seeds of savoy cabbage for an early crop, leeks, main-crop peas, sweet corn, turnips, carrots, beetroot, cauliflowers, broccoli, round-seeded spinach, New Zealand spinach, parsley, dwarf and runner beans, melons, pumpkins, squash, and vegetable marrows.

Make successional sowings of lettuce and radish to keep the house supplied with salad crops. It is better to sow short rows every week than to make big sowings and produce more than can be used when they are ready.

Plant out silver beet, main-crop potatoes, lettuce (which should be watered in if necessary), and tomatoes.



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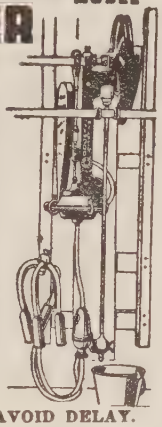

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Much Damage to Carcasses of Pigs Can be Avoided

By J. E. McILWAINE, *Assistant Director, Livestock Division, Wellington.*

CONCERN is felt in many quarters at the continued prevalence of bruises and weals on the skin of pig carcasses. Farmers, dealers, and carriers should do their utmost to avoid causing skin blemishes, which may bring about the degrading of otherwise prime porker and baconer carcasses. Much can be done by a little more care and patience, the use of a proper yard and loading race, and the absolute prohibition of rough handling, stock whips, and sticks. Some time ago an appeal was made on similar lines concerning the handling of lambs and sheep to avoid bruises and superficial blemishes. The position in regard to pigs is of equal importance, as many animals arrive for slaughter in a marked and bruised condition.

THE economic aspect of the matter should appeal to all concerned. Pigs show superficial marks after slaughter more readily than other classes of animal, but to some extent superficial marking can be reduced by resting the pigs for up to 36 hours before slaughter. It has been shown that this practice also improves the curability of the carcass, but quite apart from this it definitely tends to tone down the effects of bruises and skin marks, and is a practice that can be recommended for the consideration of slaughterhouses.

Yard and Loading Race

In many cases it is difficult to know the actual culprit when pigs pass through saleyards and various carrying agents. Hence, an appeal must be made to all concerned. It should be realised that the handling of pigs is a tedious business, and plenty of time should be allowed for carrying out the work. It is desirable that the position should be very considerably improved, and everyone should share the responsibility of bringing about an improvement.

The farmer-producer can do his part by carefully loading and unloading his pigs when he takes them to the saleyards or to the works. He can assist the carrier in loading pigs at the farm and impress on him the need for careful handling in transport.

The provision of a simple yard and loading race will do much to assist careful and efficient handling and loading at the farm. The time wasted in trying to hunt pigs from one place to another with sticks is as nothing compared with the damage done to tempers and nerves of both pigs and hunters.

This trouble is often seen at its worst on the farm where no loading facilities are available for the convenient despatch of pigs to the works. Men and dogs attempt to catch pigs in the paddock, the pigs being eventually hunted to a standstill, when they are caught and literally carried one by one into the waiting lorry. A fevered condition is thus set up, and a good deal of unnecessary bruising results from this method of loading. Because of the great importance attached to this aspect, sketches and diagrams of suitable loading races are published with this article.

Lifting Pigs

When it is necessary to lift a pig the correct method is to seize a hind leg and not to depend on the ears or tail. If a porker pig is being dealt with the near hind leg is seized firmly below the hock with the right hand, and the left hand and fore-arm are placed underneath the breast behind the forelegs. The pig can be lifted and carried in this way without bruising. Heavier pigs will require to be lifted by locking both arms around the chest behind the forelegs.

A careful system of handling should be followed in all cases. A certain amount of bruising is unavoidable and will continue to be a source of loss. When pigs come on heat in transit they usually get badly scarred and bruised over the loins and back by the feet of other pigs in the truck. Such bruising is unavoidable or impracticable to control.

Damage by Carriers

Carriers who habitually deliver bruised and marked pigs at the works or rail should be warned, as such injuries are reflected in the grading sheet returned to the farmer. As far as possible, the carrier's trucks and railway trucks should be loaded with pigs of the same class—porkers with porkers, baconers with baconers, and choppers separately. Obviously marked or bruised pigs should be well rested before slaughter. At the works careful untrucking is necessary, and care should be taken when driving the pigs into the holding pens and up the race to the sticking pens.

Pig carcasses showing marks of careless handling.

An apparently innocent-looking mark on the live animal shows up surprisingly when the pig has been scalded and cleaned. These marks become still more accentuated when the carcass has been hanging for some hours in the cooling-room. It is possible for the inspector to give the carcass the benefit of the doubt at the time of inspection and for extensive markings to show up when it has been chilled.

Few people seem to realise how easy it is to raise a weal on the back, loins, and hindquarters of pigs. The thicker skin of the head and neck is not easily marked, but the pig is generally very susceptible to skin blemishes and weals.

Cause of Blemishes

How are these blemishes caused?

It appears from the very nature of the reddened weals that the majority are caused by stock whips, fine sticks, and even dog bites. Occasionally those about the head and neck are caused by the pigs fighting among themselves in the trucks.

The larger, more diffuse bruises are apparently caused by kicking, by pushing and general rough handling in and out of trucks. In exceptional cases a stag or rig pig placed unknowingly in a truck with other pigs can

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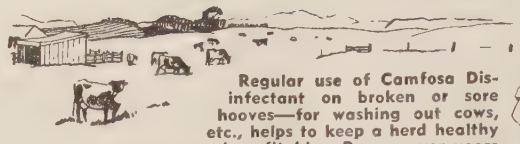

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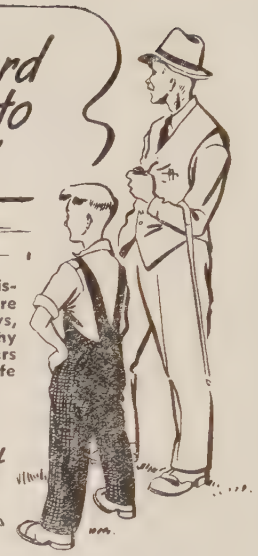

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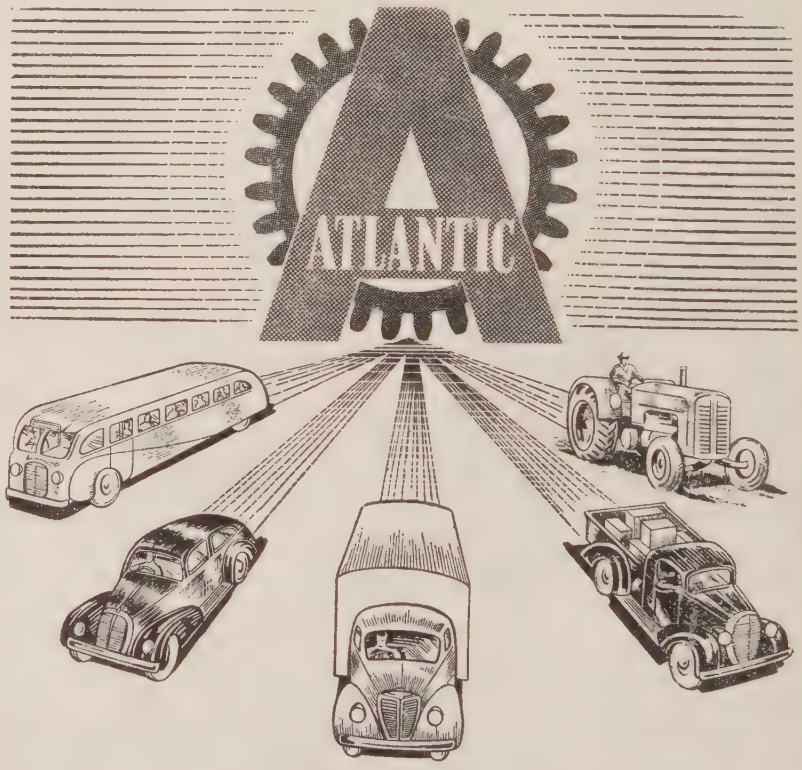

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do immense damage. In this case the tendency is to produce flesh wounds, gashes caused by the tusks, rather than bruises or weals. The farmer must be blamed for allowing a stag to be trucked with other pigs.

A very great amount of this injury could be avoided if reasonable care and co-operation were used. In the first place, the use of stock whips should be prohibited in the driving or loading of pigs. The use of sticks should be confined to the least vulnerable and least valuable parts of the pig.

The only parts of a pig which cannot be seriously injured by sticks are below the hocks on the hind legs and the snout. A broad lash made from a piece of old cycle or car tube is more useful than a stick. All kicking, rough handling, and biting dogs should be eliminated.

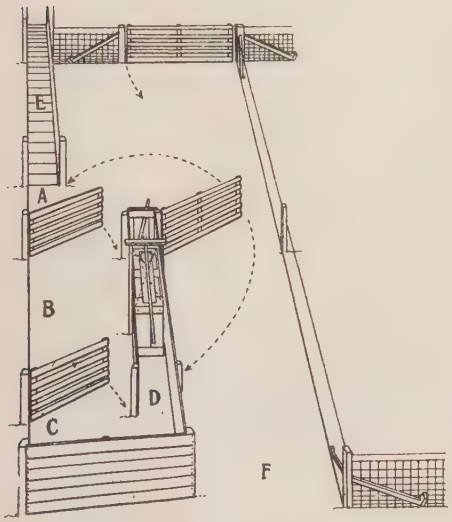
It is true that the pig is considered a most obstinate animal, and it is said that it frequently takes the opposite direction to that desired. The use of proper loading races or banks and the exercise of patience, with permissible persuasion on the parts indicated, will do much to eliminate this as a cause of degrading of carcasses.

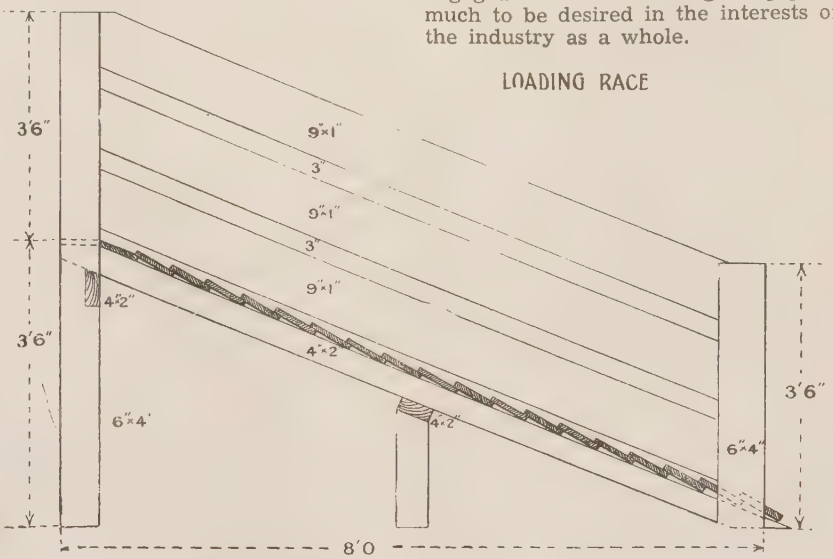
Considerable progress has been made in raising the standard of pig husbandry in recent years, resulting in a reduction of castration abscesses, pleurisy, and other septic conditions. It is hoped that this progress will continue, but some of this good work will be nullified if unnecessary bruising and marking persist.

Complaints from Overseas

There have been complaints from overseas about the skin marks, blemishes, and weals seen on New Zealand pigs in the Home markets. It appears that marked pigs are not desired by the trade even though they are in a lower grade and can be purchased at a cheaper price. Weals and skin marks are also a distinct reflection on our careless methods of handling the live animals. No amount of scalding, scraping, singeing, and dressing can remove some of the marks, and in some works singeing is not possible and porkers are not singed as a general rule.

As the trouble can be rectified with the exercise of a little more care and patience, the co-operation of all those engaged in the handling of pigs is much to be desired in the interests of the industry as a whole.





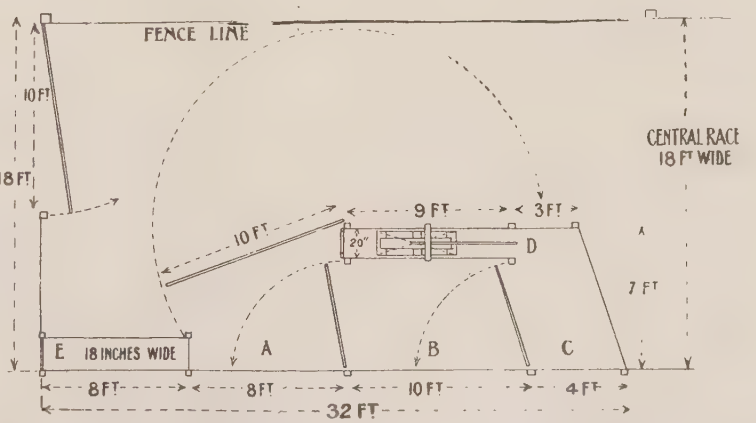
LOADING AND WEIGHING PEN: SUITABLE FOR THE WAIKATO PLAN
WALLS OF PEN 3'6" HIGH

Timber Required and Costs.

	Running ft.	
Uprights for race	21 ft.	6 x 4
Pillows and ramp joists ..	24 ft.	4 x 2
Side of race	54 ft.	9 x 1
Ramp of race	30 ft.	6 x 1

Ground and Perspective Plan of Loading, Grading and Weighing Yards.

A. Receiving Yard.
B. Holding Pen.
C. Grading Pen.
D. Weighing Race.
E. Loading Race.
F. Central Race.



The 10ft. gate hinged to the front corner of the weighing race swings as indicated by the arrows. When pigs are brought into the yard from the central race F., they have a clear view through the end gate and fence and rapidly enter the receiving yard A. By closing the gate from the weighing race to the loading race there is no possibility of the pigs escaping as they begin to find themselves confined in the yard A.

All walls and gates are 3ft. 3in. high of 6 x 1, 9 x 1, or 12 x 1 boards, which should not be spaced more than 3in. apart.

THE

WOLSELEY

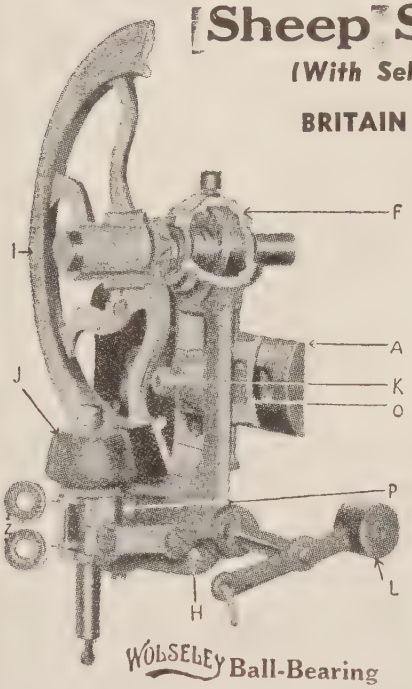
First in 1877

Best in 1946

WORLD'S RECORD BREAKING
Sheep Shearing Machinery

(With Self-Aligning Ball Bearings)

BRITAIN DELIVERS THE GOODS AND BUYS YOUR WOOL



WOLSELEY Ball-Bearing

Brackets provide A.K.O. for quick and exact adjustment in any direction on arcs of circles for earthquake displacement.

"P" Friction Arm working on arc of circle avoids old straight in and out bumping contact. Fitted with long life "J" **Rubber** Friction Cone mounted above and out of the way of grease cups—correct load distribution.

Although supplies are uncertain and are likely to be so for some time to come, we can still supply complete Plants—both Shafting and Electric.

You will be well advised to place your order NOW, even if you do not want immediate delivery—we can then reserve your requirements for delivery when required.

World's Record Breaking No. 10 Handpieces, Combs and Cutters sent out with all complete Plants.

Will owners of Wolseley Plants place their orders **immediately** for Shearing Season's requirements, otherwise we cannot guarantee delivery.

Send for descriptive leaflets "Z," "L" and "N."

CHEAPEST TO INSTALL. CHEAPEST TO RUN. MOST EFFICIENT.

Wolseley Electric Plant with Wolseley Capacitor Type "Wonder" Motor.—Fit anywhere at any height.

No belting or friction Cones—saves friction, wear and power.

Starts and stops instantaneously by turning the switch.

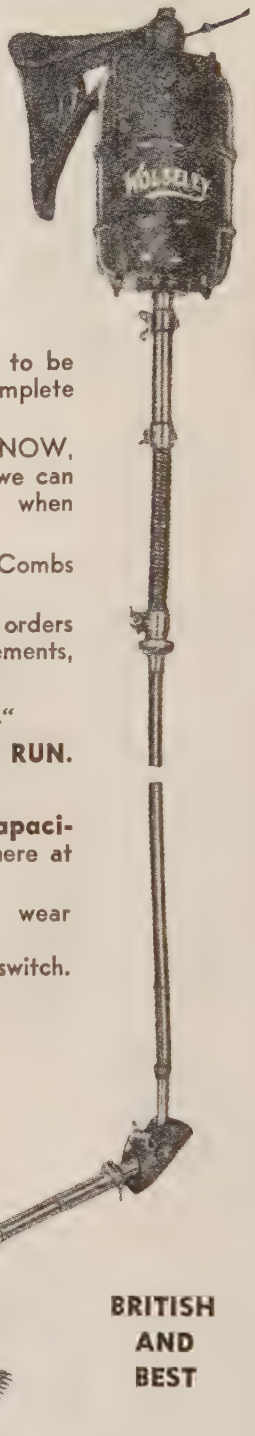
No motor lubrication required for ten years.

No carbon brushes to wear.

Cheapest to wire and easily portable.

Charge for current normally under 3d. full working day.

Thousands installed throughout New Zealand.



The business end of the shearing plant—the WOLSELEY HANDPIECE, which has made every World's Record Machine Shearing tally. At present this can be supplied only with Wolseley plants. Daily tallies made—433, 417, 412, 409, 406, 383, 374, 373, etc.

BRITISH AND BEST

DALGETY & COMPANY LTD., Wellington—*Chief Agents.* District Agents Throughout N.Z.

First Aid in the Home

TREATMENT OF WOUNDS

THE farmer's wife has need to be versatile—perhaps even more than her city sister. She must be prepared to meet many emergencies not encountered in the towns, and to deal with them alone. Self-possession, knowledge of a few fundamental principles, and common sense are all that is necessary to enable the housewife to be an efficient "first-aider." This series of articles by the St. John Ambulance Association, Wellington, tells what should be done before the doctor comes.

IN deciding the extent of first aid treatment to be applied the attendant should be guided by the time that is expected to elapse before skilled medical treatment can be given. If a doctor is readily available, or if the patient can be taken to hospital in reasonable time, the duties of the first-aider are fairly strictly limited. To attempt more than is necessary may interfere with subsequent treatment.

TREATMENT OF WOUNDS

In a case of severe bleeding, for example, it is imperative first to stop the flow of blood. Dirt must be kept out of the wound, or dirt already there must be removed. If the bleeding is not profuse it may, perhaps, serve a good purpose by washing some dirt from the wound, but eventually it must be stopped. Pressure applied on and around the wound by means of a sterile pad is the best method of dressing such a wound.

As a general rule the application of a tourniquet is justified only if profuse bleeding continues in spite of local pressure, for a tourniquet, by stopping all circulation to the part, lowers the vitality of the tissues and may deter healing.

Preventing Contamination

Prevention of further contamination of the wound is one of the first-aider's most important duties. The doctor will probably cleanse the wound thoroughly, but the first-aider should guard against further soiling. Among sources of serious infection by virulent organisms are the noses and mouths of the patient and attendants, who, even though healthy, may breathe out a fine spray (particularly in talking, coughing or heavy breathing) which may settle into a wound and do great harm. It is to avoid this that doctors and nurses wear masks when operating. Almost any sort of covering promptly applied, even a sheet of paper loosely laid over but not touching the wound, will go far to avoid contamination from this source.

Dressings

It is desirable to apply a permanent dressing, but this should not be rushed, for if contaminated material is used, the wound may become infected. Hence, it may be well to delay the dressing until suitable material can be obtained. Sterilised gauze is best, and, if possible, nothing else should come into contact with the wound. It is not so important for the bandage which is to hold the dressing in place to be sterile, but, of course, it is better so.

If severe haemorrhage (bleeding) or some other factor should make it imperative to apply a dressing of doubtful cleanliness, what is the safest? None is safe; but some materials are more apt to be harmless than others. Washing will remove and kill some bacteria, ironing will kill many more, and if the clothes are boiled in the washing process they will be even safer. Household linens—sheets, tablecloths, etc.—are not very likely to be contaminated with virulent bacteria in the first place. Therefore, as an emergency dressing, one might reasonably give preference first to washed and ironed household linens, and secondly to washed and ironed body linen (shirts, etc.). Handkerchiefs should not be used unless boiled. Certain kinds of paper, such as the under-sheets in a pad of note paper, may be used in an emergency.

If no safe materials can be obtained it is better to leave the wound undressed than to use dirty rags, but if the bleeding is severe enough to endanger life something must be done even at risk of infection. The question of the degree of emergency becomes paramount. Remember, it doesn't take very long to boil a piece of cloth which will then be much safer as a dressing, even while wet, than the same cloth dry but dirty.

The cleansing of a wound of contamination which took place at the time of injury is a surgical procedure, and, except in the most trivial cases, should not be undertaken by the first-aider. In a severe injury this may take an hour or more of the surgeon's time—he will wish to cleanse the skin around the wound, to remove every scrap of dirt which may have entered, to remove fragments of dead tissue, and to leave only healthy tissue behind. Obviously this is often impossible if infection has already become established in the wound—and this takes only a few hours. The importance of getting surgical attention promptly is clear.

The problem of preserving the health of the injured tissue is a broad one. It involves the general condition of the patient (shock, etc.) and the circulation of blood to the parts as well as the local condition of the injury. If the injury is at all serious, the part should be supported by thick dressings, slings, or even splints in order to keep the injured tissues as still as possible.

REST is one of the most important requirements which the first-aider must observe. When a wound is dressed it should be left alone.

As an antiseptic, simple tincture or solution of iodine still remains a first-class skin antiseptic, and is very valuable in preparing the skin for incision, and for minor abrasions and scratches. It must be weak, however, if it is to be left on the skin—about 2.5 per cent.—for stronger solutions diminish tissue resistance and may burn the skin. Antiseptics of proven efficacy which can be used freely and are safer in the wound than iodine are on the market.

SUBSCRIPTIONS AND CHANGES OF ADDRESS

Subscribers to the "Journal" may greatly assist the work of distribution if—

1. In giving notice of change of address the old address is also notified.

2. Names and addresses are printed in block letters.

EXCHANGE SHOULD BE ADDED TO ALL CHEQUES.

"Come then: let us to the Task"

They are rebuilding their shattered towns and villages in Britain, but they cannot win their reconstruction without food to sustain them, to give that vital margin of physical reserve.

Yet, today the people of Great Britain have no more food than in the worst war years!

In her hour of need, Great Britain looks to her Dominions to give her that extra food. THAT, is OUR solemn duty.

Let us rally to the same stirring call sounded by Winston Churchill in the darkest hour of the war:

"Come then: let us to the task"

	TONS
Butterfat	190,000
Meat	530,000
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Wheat	250,000
Malt Barley	40,000
Milling Oats	50,000
Feed Barley	15,000
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Potatoes	25,000
Onions	1,000

FOOD PRODUCTION IS OUR JOB

Fight Famine!

Prepared by the Department of Agriculture for the Famine Emergency Committee.

Her Gift was Laughter

I HAVE just returned from visiting a friend. Distance—and circumstances—prevent us from foregathering as frequently as we used to, but that makes little difference to our regard for one another. No matter how much time may elapse between our meetings there is never the slightest constraint or awkwardness even in those first few moments of our coming together. We simply resume our relationship as if we had been separated for hours only, instead of months. And the reason for this special sense of oneness? Apart from the magnet of our mutual interests, I think our friendship flourishes more vigorously than most because my friend possesses such an unquenchable sense of humour. She always sees the comical side of an untoward incident; she invests the recital of the dullest domestic details with drollery; and she can bring a smile to the most woebegone countenance by reason of her innate cheerfulness. In effect, it is as if she had made a compact:

A little while for laughter—
This is the vow we keep;
If in some dim hereafter
We should have cause to weep;
If some dark-dawned tomorrow
Should twist our hearts in twain,
If we should meet with sorrow
And walk a while with pain—

No one, my love, can take away
This mirth that we enjoy today.

You would never dream to look at her that she is the mother of a large family with all that it implies of responsibility and sacrifice. She has coped successfully with sickness, a too-small house, and a scarcity of labour-saving equipment which would have daunted a much stronger woman. If ever anyone had cause to sigh for lost leisure and indulge in a little justifiable self-pity, she is that person. Yet her natural gaiety has remained undiminished, a bubbling well spring refreshing all whom she encounters, cleansing them of their cares and irritations.

Thackeray defines cheerfulness thus: "It means a contented spirit, it means a pure heart, it means a kind and loving disposition, it means humility and charity, it means a generous appreciation of others, and a modest opinion of self." It is not the prerogative of those whose lot has fallen in pleasant places—rather the reverse. Its ever-welcome possessors are more often than not people whom life has used hardly. They have met with difficulties and disappointments; they have known grief and trouble, yet they have not allowed their misfortunes to embitter them, but have constantly disciplined themselves to make the best of things. Because they have lived through grey days of anguish they realise in fuller measure the healing value of laughter—"a good laugh is sunshine in the house"—they have developed a greater capacity for sympathy and kindness, and a more wholehearted enjoyment of life's lighter moments.

I have always liked these verses by A. M. Lawler concerning a former neighbour of hers:—

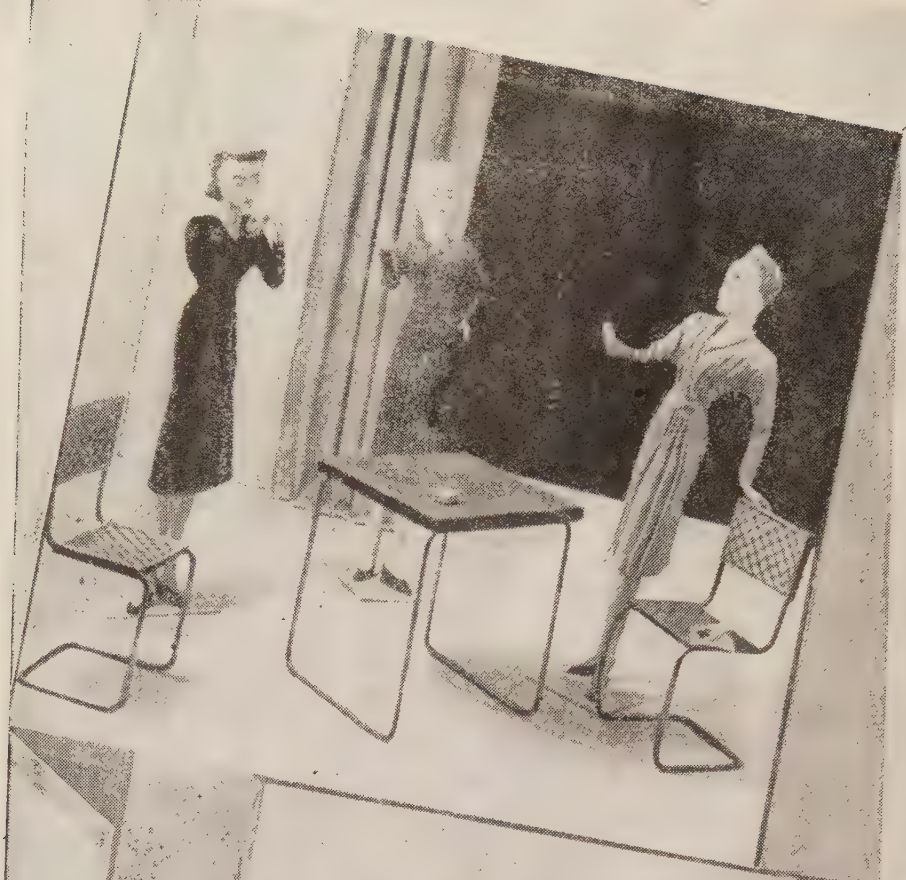
[*Weekly News photo.*

She wasn't talented
Or clever;
She couldn't sing or sketch
Or ever
Twist words with
A subtle art—
She simply had
A merry heart!

She wasn't wise,
She wasn't witty,
She wasn't even
Really pretty;
Yet we remember her
Long after
She moved away—
Her gift was laughter!

Though our individual abilities and opportunities vary considerably, we all have one thing in common: "It lies in our own power to attune the mind to cheerfulness." The decision is a personal one. May we choose wisely so that the folks we meet will be gladdened by the contact, and we, too, will merit the tribute—"her gift was laughter."

Mary



Mannequins in Miniature

Royal Fashion Note

Her Majesty Queen Mary wore a wool two-piece suit in a powder blue toning when she visited the Exhibition of Knitwear staged by the International Wool Secretariat in London recently.

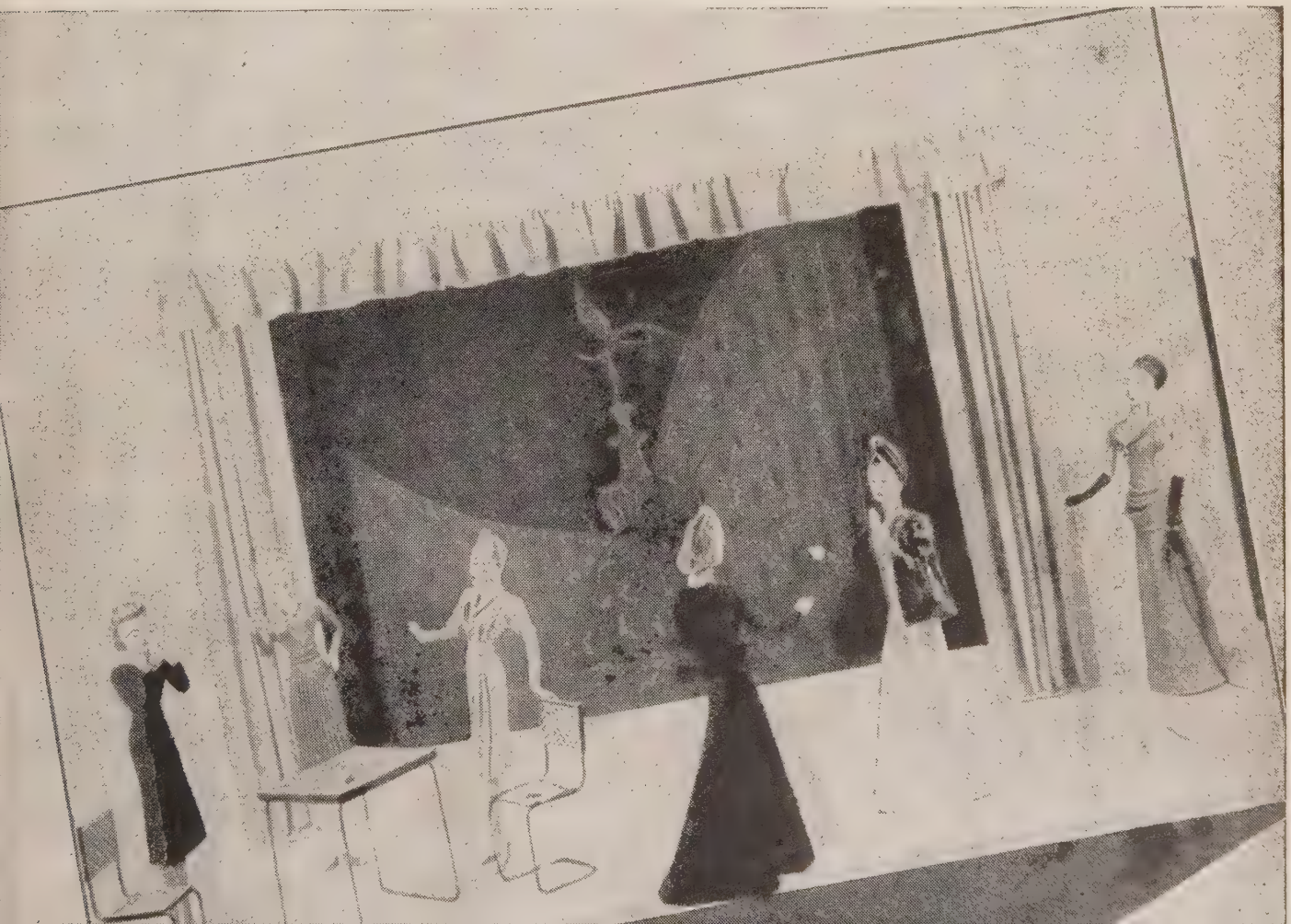
Wool Fashions Display for New Zealand

IT IS a far cry from the first fashion dolls created by French dressmakers of the 14th century to the beautiful models gracing the show-cases of the latest display designed by the International Wool Secretariat at the request of the New Zealand Wool Board. These delightful little puppet mannequins with their delicate features and lifelike colouring will soon be on view in New Zealand so that the general public and womenfolk in particular will have an opportunity of seeing the exquisite fabrics and elegant modes which can be fashioned from wool.

The lacy filigree of the trees in St. James Park forms a fitting setting for the parade of new daytime ensembles. A slender figure in a jacket dress of gold and turquoise diagonal weave wollen material pauses to admire the scenery while her ultra-smart friend in a two-piece of silver-grey tropical worsted with pale gold facings tilts her wide-brimmed hat at an even more becoming angle. The lady taking her terrier for a stroll sports an appropriately dashing jumper suit of gay printed wool on a red ground, the three-quarter length sleeves being cleverly accentuated by long black gloves. Her companions' suits, though both of worsted, present a striking contrast, one being in "dressmaker" style with a gathered skirt and full peplum on the jacket, and the other trimly tailored. The only wearer of a top-coat has chosen a shade that is the very epitome of spring—palest green, decoratively saddle-stitched in brown, and crowned by a tiny leaf-shaped hat.

"Nightpiece in London" could well be the title of the second scene, which is played against the wide window of a Piccadilly flat looking out on to the statue of Eros silhouetted against a starlit sky. The hostess is in a graceful dinner dress of fine black wool, slightly trained and having bead embroidery on the dolman sleeves. Her bridge-playing guests are frocked in wool crepe, flower colours predominating—soft blue with a swathed waistline and knife-pleated skirt; deep violet, distinctive in its simplicity of line; dusky pink pleated from shoulder to hem. The more formal evening attire of the two visitors who are going on to the ballet later in the evening is of this attractive material, too, the draped gown of gold with turban and finger-tip length jacket of printed wool vying in elegance with a petunia model which features an apron front and cap sleeves.

These mannequins in miniature are not only charming exponents of feminine fashions, but also demonstrate the primary importance of the wool industry in relation to fabric manufacture and design.



BY THEIR STYLE YOU WILL KNOW THEM

SHOES FOR EVERY SEASON

They're smart enough, light enough for any summer wear, yet rugged enough for anything that winter can bring. You'll like the good shapes, the fine solid leathers, the honest-to-goodness workmanship of Russell shoes—and, oh, how they fit. They're designed to give your feet full freedom of action with just the support that's needed to make walking a pleasure. Leading shoe stores everywhere are showing Russell shoes in an increasingly good variety.

Made by the manufacturers of the famous "Friendly Fit"— super quality shoes for men.

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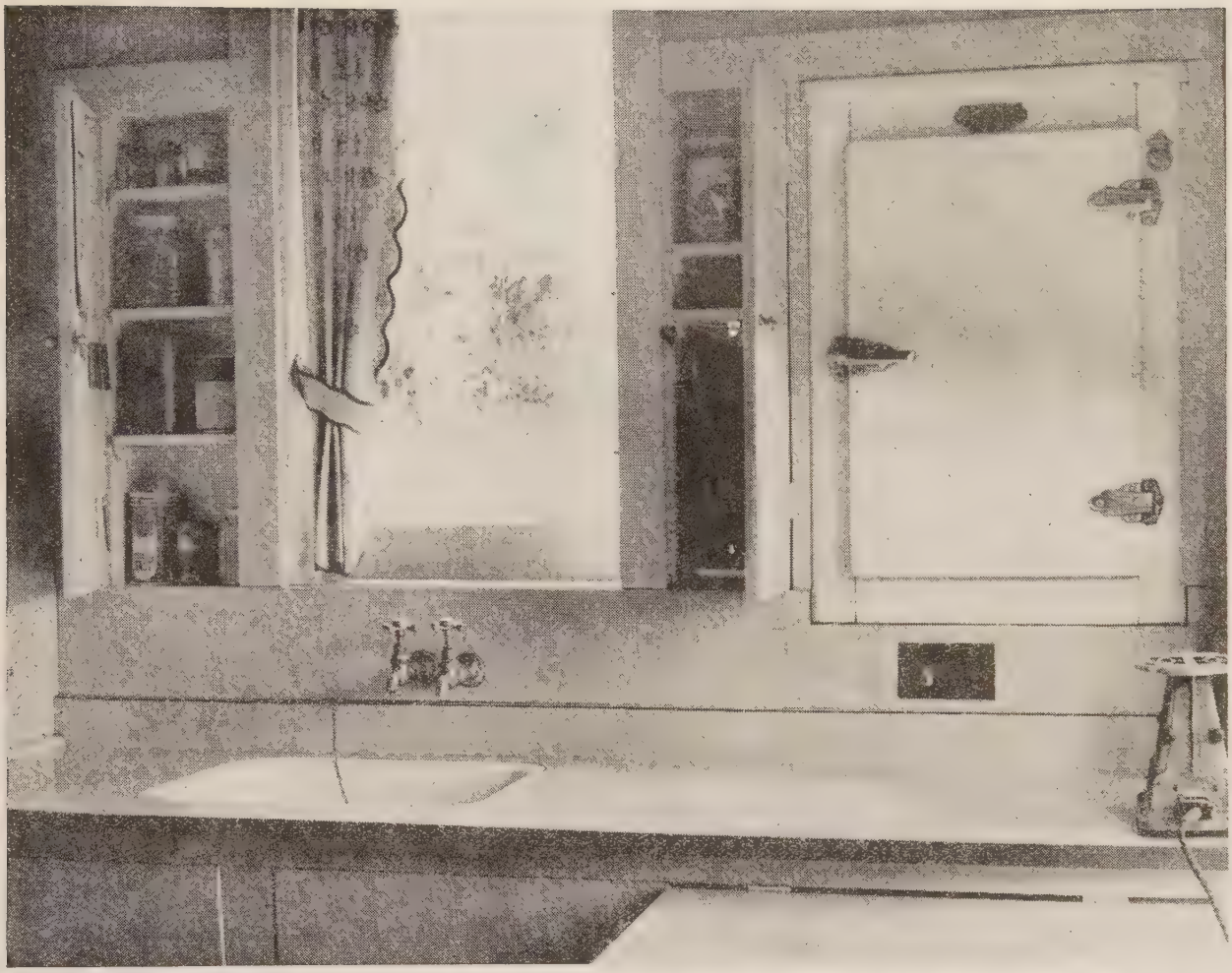


MODERN BUILT-IN FURNITURE

By NORMA K. METSON, *Rural Sociologist, Wellington.*

BUILT-IN furniture is a feature of modern houses. The minimum expected in a new house is a wardrobe for each bedroom, linen cupboard, complete kitchen cupboards, a small cupboard in the bathroom, and shelves in the laundry. If there is a maximum of built-in furniture, rooms can be completed with very few individual pieces.

REALLY adequate built-in storage space is the dream of hundreds of housewives who have struggled for years with clumsy old-fashioned kitchen dressers, dust-catching curtained wardrobes, and a house which despite all efforts is perpetually untidy because there is no place in which to put things. There is general agreement that built-in cupboards, wardrobes, and shelves are the most satisfactory places for storing household goods, but other types of built-in furniture are not as common.

For and Against

The main advantage of "built-ins" is that they use space economically—the pieces fit exactly and there is no need for passageways beside or behind. In small rooms this compactness and the use of structural lines and surface finishes which correspond to those of the room will give an effect of greater spaciousness, and the free area left in the centre of the room is larger. The use of built-in fittings instead of walls for partitions between related areas of the house—for instance kitchen and laundry—also helps to overcome restrictions in space.

The biggest disadvantage is loss of flexibility; built-in pieces cannot be moved about the room to vary the arrangement, and a family which moves from a house with plenty of "built-ins" to one with few must incur a heavy expense for furniture. Because of this immobility it is essential that built-in furniture should be well planned for its position in the room and in the details of the fitting.

For some rooms it is best to plan furniture that is deliberately non-committal—a set of drawers and cupboards that could be equally useful in a bedroom or dining room, a flat-topped fitting with drawers on each side suitable for a dressing table or desk. This will make simpler adapting rooms for different uses as family circumstances change.

Photograph in heading by Sparrow Industrial Pictures Ltd.

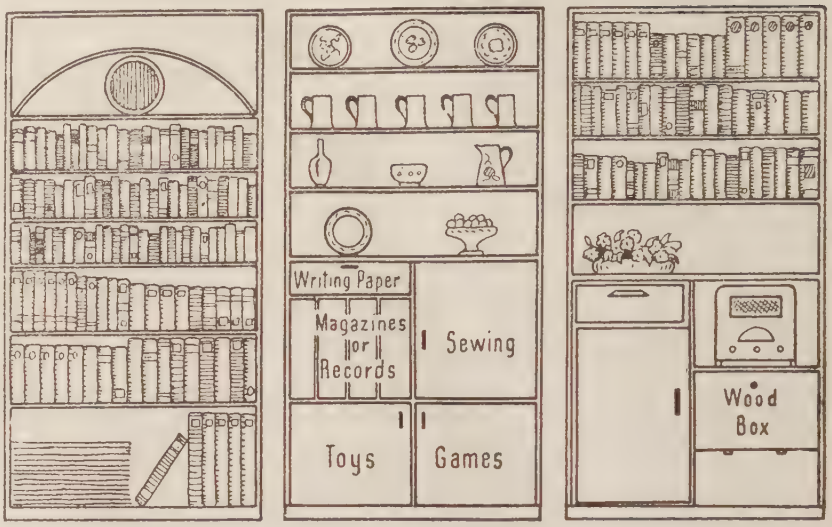
Suitable for Farm Homes

For farm homes built-in furniture is, on the whole, very suitable. The farm home is likely to be permanent, families are sometimes large and space limited, and there is so much to store —food, fuel, tools, materials for games and hobbies are only part of the total. Also, there is frequently some member of the family who can do the carpentry required. The best fittings (provided they are well planned) are usually those which are installed as the house is built, but living in a house often makes plain unforeseen needs, and home planning and carpentry can produce satisfactory results in adding what is necessary.

If the fittings are to be built by amateurs, careful planning and measurement are essential. There are plenty of books which give directions for the carpentry, but each fitting presents an individual problem in design. Good proportions and harmony with the existing structural lines of the room are both necessary if the finished piece is to be a success, and they will not be achieved without careful thought. A rough scale sketch of what is required should be made first, estimating the sizes and the most convenient positions for the drawers, cupboards, etc. Squared paper is a great help in drawing plans. Then the available space must be measured accurately, and the original sketch replaced by working drawings which show all the details needed in the construction.

Using Inconvenient Spaces

Here are some suggestions for making use of some of the inconvenient spaces often found in old houses, for example the recesses next to the fireplace. In bedrooms these are ideal for wardrobes, for which they are frequently used. If there is a good light on one side from a nearby window, that recess can be used to install a dressing table or writing desk and the other for a wardrobe or a set of drawers.



Fireside alcoves can be arranged for many different purposes.

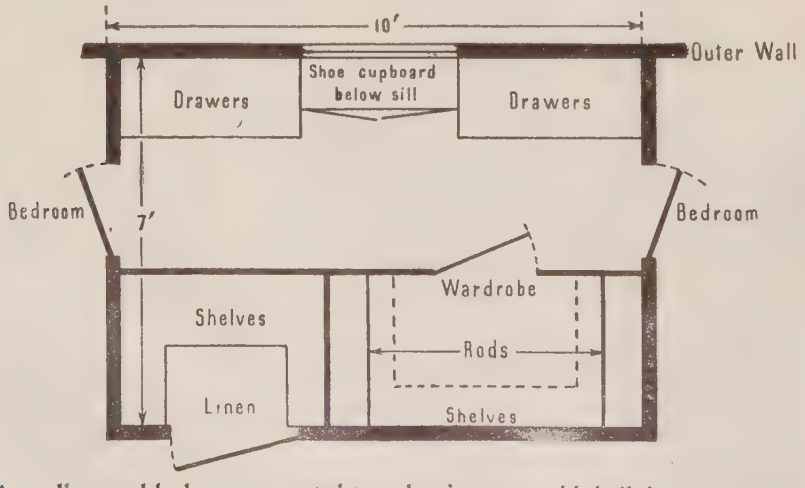
Fireside alcoves in living-rooms have great possibilities and can be fitted with numerous combinations of cupboards and shelves. The cupboards can be for storing sewing, toys and games, magazines, or china, while the shelves can be open or glassed and used for books or for displaying precious collections of china or ornaments. Built-in niches for the wireless and coal or wood box will often solve the problem of having these essential pieces of equipment handy but out of the way. If the fireplace is no longer used, the grate, or perhaps the whole fireplace, can be taken out, the chimney blocked, and the resulting cavity turned into a cupboard. Another method, which is particularly suitable if the fireplace is flush with the wall or projects only a little, is to build it over with wall-board and use the shallow niches at each side for bookshelves.

A Place for the Heater

Many people have the problem of an electric heater (movable or permanently installed) which does not look important enough against a blank wall to provide a centre of interest for the room, though people naturally congregate around it. A most effective solution is to build a set of bookselves and cupboards along the wall, leaving an adequate inset space for the heater. This arrangement looks better from an aesthetic point of view, and is also more satisfactory psychologically because, without being in any way an imitation, it provides a substitute for the fireplace and mantel to which we are accustomed.

Bay windows invite a window-seat, which will be much more useful if it has a lift-up top, or drawers and cupboards built beneath it. Low cupboards like this are particularly suitable for toys. A wide, square bay could even have a low sprung divan, useful for day-time resting, or as an extra bed in an emergency, and a small window can have bookshelves or a cupboard built up to the level of the sill.

A very luxurious arrangement, if the space can be afforded, is to turn a small bedroom, especially if it is between two larger ones, into an up-to-date dressing room. The door opening into the passage can be rehung to swing outward and enough space partitioned round to make a cupboard



A small unused bedroom converted to a dressing-room with built-in storage space.

for linen, coats, or general storage. There should be room next to this for a large wardrobe in the dressing room; a set of drawers can be built each side of the window, with a shoe cupboard between, and space left in the side walls for doors opening into the bedrooms. The arrangement will of course vary with the size and shape of the room and the type of storage space most needed.

The same idea, on a smaller scale, can be used to make the best of a big old-fashioned wardrobe. If it is wide enough, a set of drawers and shelves can be built down one side for shoes, hats, and clothing. If it is deep the rod for hangers should be put along the side and drawers built at the back.

A hall which is too big can be made both more convenient and more homelike if one or two cupboards are partitioned off for outdoor clothes or sports equipment.

Kitchen Fittings

Built-in kitchen cupboards make the housewife's work very much easier and here are some convenient arrangements.

If the kitchen is too big, the cupboards should be built out from the walls to make the floor space much smaller. A large kitchen which is used for meals and as a part-time living-room, as well as working, may be made more comfortable for everyone if a partition of cupboards is built to divide the working area from the living space. This type of fitting is best if the end is rounded so that people going past in a hurry will not knock against sharp corners, and it will be easier to serve meals if an 18in. gap is left between the top and bottom sets of cupboards for the last three feet so that there is some bench space. If desired, silver drawers and china cupboard can be made to open on both sides.

In a smaller kitchen a built-in dining alcove will save room. Many old kitchens have no safe, though a safe is really essential, even if the house has a refrigerator. If there is no suitably cool place on an outside wall, the problem can be solved by building a cooler cupboard with floor-to-ceiling ventilation in some other convenient place in the kitchen or storeroom.

Kitchen storage space should be planned so that things are kept in the part of the room where they are most frequently used—saucepans between the stove and sink; flour, sugar, and mixing bowls near the working surface which it is most convenient to use for baking. In store cupboards there should be some special shelves made high enough to take tall bottles and packages; the others can then be put closer together.

It is a mistake to plan wide shelves for storing china and small food supplies, as things become stacked behind each other and are difficult to reach. Top shelves of frequently-used cupboards need to be within easy reaching height; the remaining space below the ceiling will make separate cupboards for stores and equipment which are not often needed. Toe recesses underneath cupboards should be deep enough for comfort, and high enough for easy cleaning.

Sewing Alcove

A convenience which many women would welcome, but which is seldom found even in new houses, is a completely-equipped sewing cupboard or alcove. This should include cupboards, drawers, and pigeonholes which will provide space for storing all sewing equipment and materials; a flat surface large enough for ironing and cutting out small articles; a convenient power plug for iron and machine; and good light, both natural and artificial. If the alcove is being planned for an electric machine, be sure that the surface on which the machine will stand is the right height for comfortable working. The living room or sunporch, a bedroom, or even the laundry, are suitable places for a sewing alcove.

Linen cupboards should be fitted with shelves of varying heights and widths. Those at the top and bottom should be large enough to take blankets, eiderdowns, and quilts which are stored during the summer, or are not regularly in use. Other shelves

Built-in fittings for a sewing alcove.

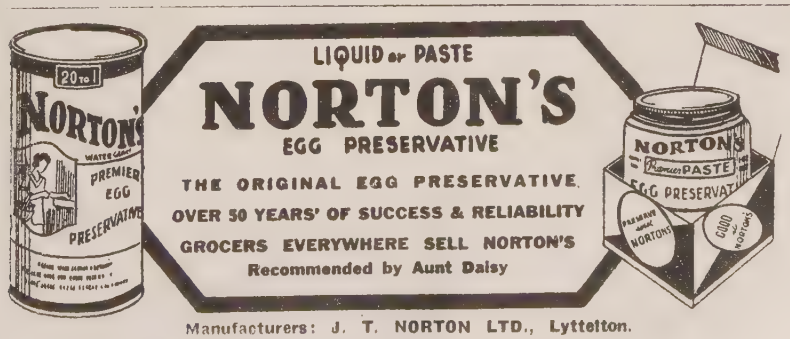
should be high enough to take the piles of linen in every-day use, and not too wide, so that all articles are easy to reach. U-shaped shelves are therefore more satisfactory than straight ones if the cupboard is more than 18in. from front to back.

Bathrooms often look untidy for lack of cupboards, or even shelves which could easily be installed. As most of the things kept in a bathroom are small, shallow cupboards in the thickness of the wall are quite satisfactory, but if a storage space is required for towels or larger articles, there is usually an area between the basin and the wall or bath which could be used for a cupboard. A locker seat with a hinged lid is also useful, and could be built as part of an enclosing frame for an old-fashioned bath.

Saving Space in Bedrooms

Sleeping accommodation for a family of children is a problem in some newer houses where the bedrooms are very small, and in these cases the use of double-deck built-in bunks instead of beds will save considerable space. Drawers may be built under the lower bunk, and a wardrobe or more drawers between the end of the bunks and the wall, so that chairs and possibly a dressing table are the only additional furniture required in the room.

Divan beds can be made less austere by building shelf and cupboard fittings around them. They are also more comfortable for daytime use as seats if the shelves at the back are about 10in. wide and arranged so that the divan can be pushed beneath them



If shelves are not wanted, the section at the back can be made as a box with a hinged lid and used for storing the bedclothes. Similar surrounds can be built for sofas or corner seats.

Any fittings which project into a room should have rounded ends. They then appear less abrupt and there is less danger from bumps on sharp corners. Built-in furniture can be finished so that it becomes part of the room background—the wardrobe door in a small bedroom should be as like the wall as possible, or it can be made to take its place among the ordinary furniture of the room. For example, a fitting of polished wood separating the dining and living sections of the room would be just as important in the scheme of decoration as a piano or dining table.

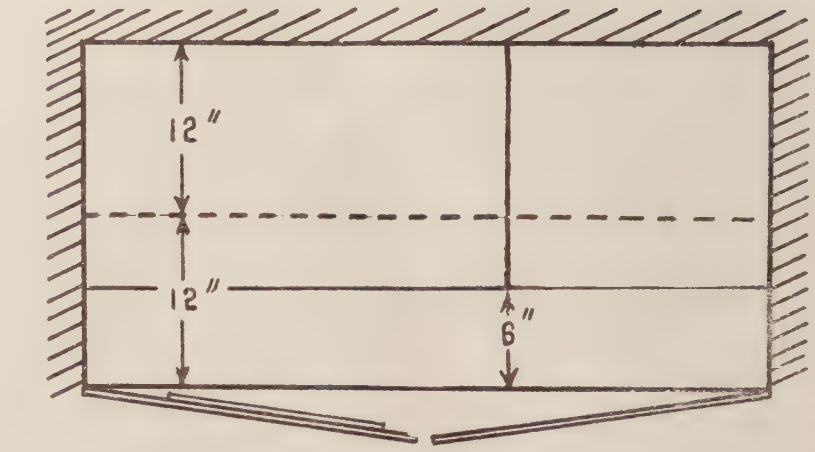
Modernising a Home

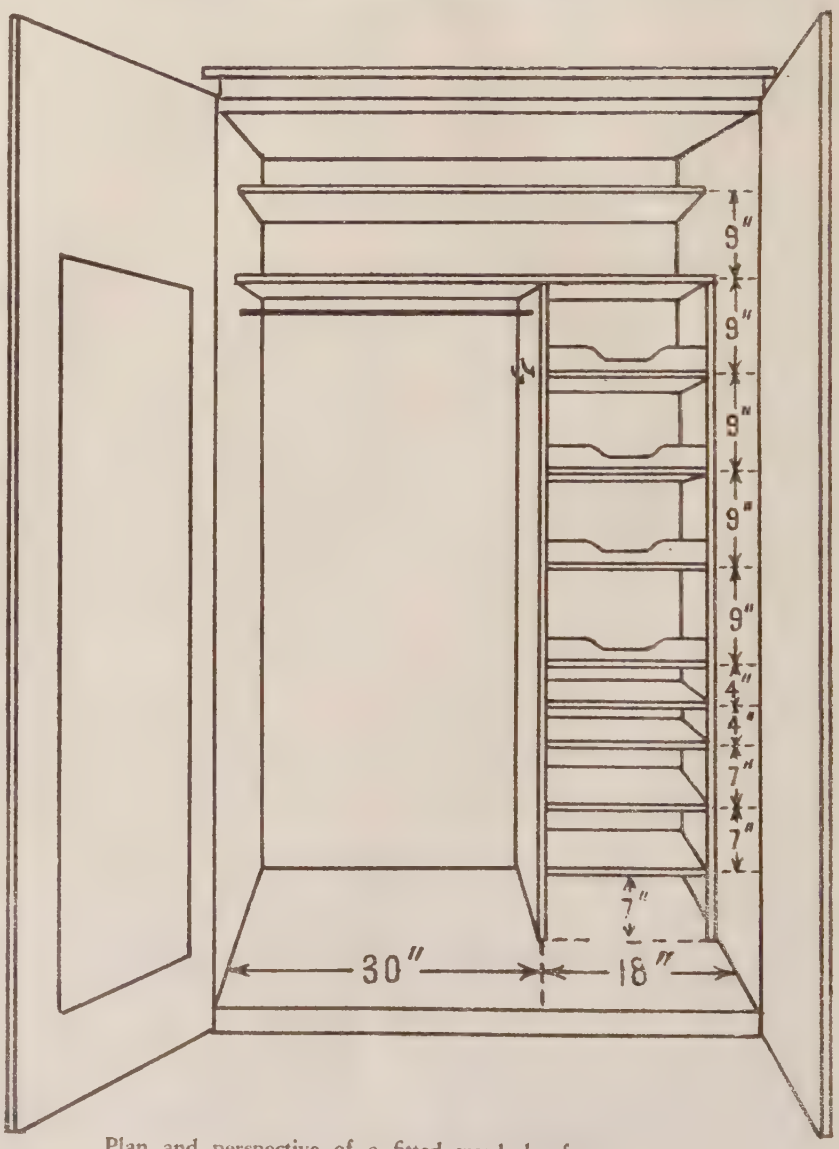
The house in which the photograph heading this article was taken is a good example of what can be done to modernise a home by adding built-in fittings. In the kitchen pictured, one shallow cupboard above the sink-bench holds supplies which are most often used there; the other is ventilated so that dish-washing necessities can be kept handy but out of sight. The refrigerator is built out over the back porch, an idea which may be helpful to anyone who wants a small refrigerator but has not sufficient floor-space for it in the kitchen. The hinged flap below the bench is useful as an extra working surface, or as a table for odd meals.

Ideas in other parts of the house are a hand-basin with storage space for soap, facecloths, and clean towels; an ingenious shoe-cleaning cupboard, tall and narrow, with a hinged front which lets down in two pieces to form a foot rest; a built-in divan with storage space underneath and a recess above for books; a curtained wardrobe for a recess where a door could not be fitted; and a broom cupboard which really has room for the vacuum cleaner and carpet sweeper. Almost every house has odd corners which can be put to work in this way.

If you are planning a new house, the kind and position of the built-in furniture should be considered very carefully. If you have an old house, a few such fittings, filling long-felt needs, will add greatly to its comfort and convenience.

Few of us know how to turn little portions into great, though gradually we are learning. Gradually we are finding a worth-while world close at hand, a world of neighbourliness, of homely heroisms, of vitalising endurances, of finding much in little.—R. Wright.





Plan and perspective of a fitted wardrobe for one person.

IT is lovely to see so many new neighbours joining us at Mary's "At Home." What a pleasure to meet you all. Recently I spent a day with a poet who lives on a lonely farm in a country valley. Her house is a most interesting one, set in an old-world garden, and her rooms are filled with books of all descriptions. May I share with you one of her poems?

Just a tightening of the hand when one is sad,
Just an answering smile when one is glad;
A teardrop, glistening, unshed,
Expressing words that cannot be said.
When one is tired—a helping hand
Stretched out in love—I understand.
A gift only small, yet wrapped in love,
Warms the heart as sunshine that falls from above;
And flowers are refreshed by the dews that fall—
So a touch of sympathy helps us all.
(A. M. Jones).

—"Peggy," Pleasant Point.

I DID not realise till recently that there are people in New Zealand who have never seen a cow at close quarters. I had a Wellington friend visiting me who told me she had never been nearer to a cow than seeing one

from a railway train. She thoroughly enjoyed the short time she spent with me in the country, seeing a few of the things that go to make up farming.
—"Hopewell," New Plymouth.

WE have only a quarter acre to cultivate, but it is surprising how much can be taken out of such a small area. We have a very good vegetable garden which produces enough potatoes to do us all the year, also a continuous supply of fresh vegetables; we have a glasshouse for tomatoes, and a fine flower garden which at present presents a good showing of chrysanthemums. Owing to the late summer in Southland our little rose garden, containing some 20 varieties of roses, is still blooming. So although we have to live in town just now, we have our own little bit of country life in our section, and some day we will go back to enjoy the open spaces. In the meantime we still keep up our interest in the "Journal."—**"Thumbs Up," Invercargill.**

I WOULD like to become a member of the "Good Neighbour" circle. Though city dwellers, both my husband and I are very keen readers of the "Journal." He is interested in all growing things and I—well, I'm an ex-country person anyway.—**"Poukai," Wellington.**

I DO enjoy your pages. Many a time on reading a par. in the "At Home" I think how much I'd like to know that person. I wonder about her—a farmer's wife with plenty to do, a garden (certainly), and perhaps a troop of children. What lovely thoughts she has—a spirit like hers could surmount any obstacle. If she can do it, so can I—thus we all draw strength and inspiration from the goodly company of "Good Neighbours."
—"Angelina," Timaru.

IT is very cold here—winter is making itself felt. The mud is everywhere: the rain keeps it in good supply! There are a few stray flowers out and my old favourite, the heath, is in full bloom. Severe frosts earlier ruined so much.—**"M," Feilding.**

I DID appreciate your page on pot pourri and think you will like this story of an old lady we knew who was completely paralysed. Yet she was always so cheerful and when we asked her how she occupied herself all day, she replied, "My dears, I always have my memories." I was a young girl at the time, but her remark made a lasting impression on me and I, too, have tried to store up a "pot pourri of memories."—**"Homespun," Halcombe.**

IT was a great thrill to find I had shared a prize with another of the inky sisterhood. I think writing on a set subject with a reasonable and moderately elastic word limit is fine experience, and the individual treatment is most interesting. It shows there must be a thousand facets to every subject, and that it is impossible for one human brain to think of them all—a warning against hasty judgment if ever there was one!

Your section is always interesting and I do like "Garden Gossip."

I WOULD like to join your "At Home," Mary, and to add my appreciation of your pages. I was especially interested in the pudding recipes—I am very fond of boiled puddings, but had not made any for a long time. Your nice recipes have started me off again!

My little nephew, who has not long started school and is a great favourite with his teacher, happened to be late one morning recently. "Well, John, what made you late this morning?" enquired teacher. "You blew the whistle before I got here," came the innocent rejoinder.
—"Natalie Ann," Taranaki.

MAY I join your friendly group? Ever since we have received the "Journal" in our home I always look forward to every number and read with interest the various paragraphs. In a recent issue I read of the experience of "Young Mother," Nelson, and thought she may be interested to hear of a young calf we have. Can you imagine my surprise when I entered the cottage we have not far from our homestead and discovered our three-months-old calf asleep on the bed? It was just as well I had gone in before our shearer arrived!—**"Relda," Banks Peninsula.**

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ISSUED BY THE DEPT. OF HEALTH

The RIGHT and the WRONG WAY to BLOW YOUR NOSE

BLOWING THE NOSE is a simple operation. But there is a *Right* way and a *Wrong* way.

The *Right* way:
Place the handkerchief over the nose without squeezing the nostrils, keep the mouth open, and blow *gently*; or grip the nose on the hard bridge so that the nostrils stay open. *This way you clear your nose safely.*

The *Wrong* way:
By pressing the nostrils tightly and blowing hard, you are liable to force the germ-laden secretions in the nose back into the Eustachian tubes (at the risk of starting middle-ear trouble, acute earache, possibly burst ear-drums); or you may set up infected sinuses by blowing the secretions back into the sinus cavities.

Clear your nose carefully and safely — and for the sake of other people cover up with your handkerchief every time you cough or sneeze.

KEEP THIS ANNOUNCEMENT FOR FUTURE REFERENCE

1c

FOR A HEALTHIER NATION

The Influence of Food Habits

THROUGH the discoveries of science, which have been accelerated by the iron necessities of the war years, knowledge of food and nutrition has been added to greatly. A speaker at the Hot Springs Conference said: "We now know more about how people should be fed for healthy, vigorous lives, and more about how the necessary food can be produced, than ever before." A working knowledge of these discoveries has been given in this series of articles, but they have to be applied to effect the desirable changes.

THERE is nothing mysterious about such practical application. Leaving out all the technical details, it means that the majority of people need to consume more milk, cheese, vegetables, and fruit—probably to double their consumption. The rationing of sugar has helped us, for more of our energy needs have been met from other foods, which have increased our intake of minerals and vitamins; sugar is devoid of both.

As in America, sugar consumption in New Zealand was very high. Sherman points out that the consumption of 90lb. of sugar a year means 444 calories a day of other food displaced by sugar, with a reduction of about one-sixth in the mineral and vitamin values of the diet.

Many Diets Need Improvement

Many diets are in need of improvement. In some families this reflects a lack of appreciation of the relation of diet to buoyant health, physical efficiency, and a long life. In others it indicates that the family's knowledge of food values is inadequate for practical application to the planning of everyday meals. In others again it means insufficient means or time. City families with limited funds for food, and rural families with restricted opportunities for home production, tend to emphasise the kinds of food that satisfy obvious hunger cheaply, and to neglect those that satisfy "the **hidden** hungers."

Most farm families have the advantage of city families in that they not only buy food but produce it for themselves. They count heavily on the garden, the orchard, poultry, cows, pigs, and sheep in planning meals Food produced on the farm may represent from less than half to more than three-quarters of the total value of the food supply of the family. The amount of food produced varies with the economic status of the family. the size of the farm, climate and soil. the amount of capital and labour that can be invested for production for home use, and the family's attitude to home production.

In this article Dorothy Johnson, Rural Sociologist, Christchurch, concludes and summarises her series of articles on nutrition, and draws attention to the world-wide changes that would come from applying the newer knowledge of food values. The influence of home food production on the farm and effects of food habits are discussed.

Nutritive Values

Some people consider that food production for family use is not worth the effort unless the farmer views it as a pleasant hobby. Others are just as sure that no other area of land on the farm with an equal amount of effort can produce in money anything like the equivalent of farm-furnished food. Few appreciate fully the contribution that farm-furnished food makes to the **nutritive** value of the family diet—a value that is greater than the amount of money involved, and not ordinarily purchased or able to be purchased for money in distant markets. For example, there is no comparison between the vitamin value of a cabbage or cauliflower cut from the garden and used at once and cabbages and cauliflowers bought by the sack from a distant market. The first two cabbages used from the sack may have vitamin value, but none of the others will.

The lower the family's income the more its well-being depends on farm-furnished supplies. Eggs, milk, butter, potatoes, green and other vegetables, and fruit are all valuable protective foods which are relatively expensive in city markets, but which can be obtained in the country in generous amounts. For a family of five a good diet may well include a gallon of milk. 5 to 6 eggs, 4oz. of cheese, 5 to 10oz. of butter, and 7 to 8lb. of vegetables and fruit every day, besides meat, bread, etc. To keep the standard up for the winter season means a policy of preserving fruits, vegetables, eggs, and sometimes butter. Some requirements, like cream, butter, potatoes, and mutton, are taken from the farm crops. Considerations of soil, climate, skill, inclination, and profits help the farm family to decide whether each essential food should be grown, bought or bartered from neighbours, or bought from stores. These considerations vary from year to year. But most of the protective foods they do not grow they go without.

In America it is found, strangely enough, that some families consider it economy to sell at farm prices protective foods that they produce in order to buy at retail prices other foods that contribute far less to the diet. Is that true in New Zealand too?

An important consideration is that when the farm family raises most of its own food the costs of marketing, manufacturing, wholesale and retail distribution, transportation, storage, and advertising are avoided. Some other considerations are not only suitable land and labour, but storage space, work space, ability to buy equipment, and the ease or difficulty of transport to shopping areas. Today a farm household is the link between the self-sufficient production and consumption cycle of the early pioneering days, which fed the family with no exchange of money, and the city family where all or most of the members market their services for money and buy all the necessities of living.

Basis for Selection

As a basis for family food selection, the foods commonly used can be arranged in 12 groups based on their principal nutritive contributions to the diet. These groups serve as a guide in making up an almost infinite variety of nutritionally-sound meals, the choices depending on personal preferences and habits, the availability of various foods, and the cost in labour or money. Taking the six protective foods only (since potatoes, meat, cereals, legumes, sugars, and fats other than butter are in most diets), Dr. Stiebeling, of the United States Department of Agriculture, has made diet plans at four levels for the yearly consumption of one person. In the table below two of these are reproduced with the equivalent quantities a week in parentheses. It would be interesting to compare actual New Zealand consumption in these groups of food. I should be glad to hear of farm families who would co-operate in working them out.

Yearly figures are useful in planning production and preservation; weekly figures are more useful for current buying. Diet plans should be treated as guides, not as hard-and-fast rules. At different seasons of the year different levels of diet are attained. When vegetables and fruit are plentiful more are used. When meat, eggs, and milk are home-produced more are used and a higher level of diet reached. If more food energy is required for heavy work or active, growing youths, the cheaper carbohydrate foods are added. Fortunately, the appetite is usually a good guide to the fuel value needed after the right quantity of protective foods has been eaten. "Eat what you want after you have eaten what you should" is a sound guide.

Extending the Prime of Life

A recent president of the American Medical Association in his presidential address said:

> "In the past peoples who availed themselves of the newer knowledge of infectious diseases that science revealed attained better health and a longer average span of life. Today science holds out to those who take advantage of the newer knowledge of nutrition a larger stature, greater vigour, and the possibility of a higher level of attainment."

Can people be persuaded that the subject is worth their attention and worth the price?

Dr. Sherman, one of America's foremost authorities on nutrition, says that a striking aspect of the nutritional improvement of life is that, with food habits guided by present-day knowledge, full adult capacity and efficiency can be reached at an earlier age and held until a later age in the same individual. The extra years that are offered are not to be thought of as added to old age. They extend the prime in any life that was not begun too soon to get the full benefit of the newer knowledge.

In the American magazine "Better Homes and Gardens" there was this year an article with the striking title "Are You Growing Old Needlessly?" In it Richard T. Davids told the story of a woman of 69 who was anxiously awaiting the verdict of an X-ray photograph.

> "The doctor, more irritated than anxious, began scolding her, 'Starving yourself,' he said. 'Just look at you. These x-rays simply show that your stomach has shrivelled. It shrinks just as any muscle would when unused. You haven't cancer. But that doesn't mean you can't die from acute starvation.' The woman beamed under the abuse. She promised to eat anything, everything, to renounce for ever the toast-tea breakfasts and skimpy suppers that centuries of tradition had prescribed for old folks.
>
> "Here is his prescription:—
>
> **To Stave Off Those Doddering Years.**
>
> "1. Start the day with a good breakfast, like eggs, fruit, cereal.
>
> "2. Drink 3 glasses of milk a day.
>
> "3. Eat one or more servings of leafy, green or yellow vegetables, plus two or more of other vegetables and fruits.
>
> "4 Eat an egg a day for iron and high-quality protein and vitamins.
>
> "5. Ask your doctor about cream, egg yolks, and butter—you may have to avoid them, good foods though they are.
>
> "6. If you are overweight, use fruit and vegetables to keep the stomach happy and make fat only 1/10th of your calorie intake.
>
> "7. Eat cheese for calcium, to keep teeth and bones tough and healthy.
>
> "8. Make your bathroom scales your guide to carbohydrate (starch and sugar) intake. Get as much as possible from whole grain.
>
> "9. Eat citrus fruits, and drink the juice to keep you and your gums healthy.
>
> "10. If you like tea, coffee, or alcohol, use it in moderate amounts.
>
> "11. Don't give up your favourite broth, or relish or other pick-me-up. Maybe it's just what you need to keep your appetite in trim."

"Long-standing ailments have been mistakenly regarded as characteristics of old age," says the National Research Council in a recent bulletin on nutritional deficiencies. "In reality they are deficiencies developing slowly over a lifetime, and may be seen beginning in childhood, even in infancy. . . . "

Most Dangerous Habits

The most dangerous eating habits are those only slightly faulty, where nutritional deficiencies are a long time, almost a lifetime, in coming on. Symptoms are vague. The cause may be long undetected. For this reason, to prolong the usefulness of middle years man must be taught proper eating habits during babyhood and must keep to them throughout youth and maturing years. Poor eating habits, prolonged cooking to make foods soft which robs them of minerals and vitamins, diet restrictions because of disease and lessened ability to use and

YEARLY AND WEEKLY QUANTITIES OF PROTECTIVE FOODS FOR ONE PERSON AT TWO LEVELS.

RECOMMENDED BY DR. STIEBELING OF THE U.S. DEPARTMENT OF AGRICULTURE.

	Eggs	Milk (quarts)	Butter (pounds)	Citrus Fruits, Tomatoes (pounds)	Green and Yellow Vegetables (pounds)	Other Vegetables (pounds)
Economical, fair diet ..	13 dozen (3 a week)	160 (6½ pints a week)	15 (5oz. a week)	50 (1lb. a week)	140 (3lb. a week)	100 (2lb. a week)
Low-cost good diet ..	17 dozen (4 a week)	230 (9 pints a week)	20 (6oz. a week)	65 (1½lb. a week)	160 (3lb. a week)	130 (2½lb. a week)

store vitamins, contribute in later years to nutritional deficiencies. British investigators report 70 per cent. improvement in "senile characteristics, like loose emaciated skin and nervous disorders, when patients are treated with vitamins B and C." Canadian doctors report that where dietary deficiencies are serious and widespread, as in Newfoundland, many women in their twenties have the wrinkled skin of old crones.

In an experiment at Mayo Clinic women with good eating habits and healthy nerves were subjected to a diet slightly lacking in vitamin B—the sort of meal thousands eat regularly. After several months they became depressed and irritable, and developed headaches, backaches, and stomach distress after meals. Appetites became capricious. They suffered from insomnia and failing memory. They were unduly irritated by noise. When the diet was corrected the symptoms vanished and even tempers returned.

How can eating habits be corrected? Mark Twain said: "Habit is habit and not to be flung out of the window by any man, but coaxed downstairs a step at a time." Eating habits can best be corrected before 40. Only the need for calories lessens as we grow older; minerals, vitamins, and proteins are still essential.

To Prolong Middle Years

A simplified dietary rule to prolong middle years is to eat heartily every day one of the following classes of food:

1. Milk, skim-milk, or cheese
2. Meat, fish, or eggs.
3. Green or yellow vegetables.
4. Citrus fruits or tomatoes.
5. Seeds of plants or cereal grains.

After that, if the bathroom scales will allow, you can tackle cakes and pies—but not until you have had the five essentials. A diet **too rich in fats** may increase the chances of hardening the arteries, of contracting certain heart and kidney disorders. **A shortage of protein** may be an important contributing factor to poor health, especially liver disorders. **Excessive starch and sugar** may result in injury to the pancreas and so lead to diabetes.

Professor Henry C. Sherman says a diet with two to four times the amount of calcium usually considered adequate to health will extend life at its prime. He recommends doubling the intake of fruit, vegetables, and milk for a long healthy life. The Hansa tribes, who live largely on milk, eggs, whole grain, and fruits (especially apricots, which are iron rich), are vigorous and free from nutritional diseases up to a ripe old age. **More important than adding years to life is adding life to the years.**

Stieglitz, a researcher into old age and nutrition, says: "The increased longevity of man may be made an incalculably valuable advance of health, vigour may be retained, and the vast potentialities of the now largely discarded elderly be developed. The reward may be a dawning of a new era of intellectual conquest, for man may then live long enough to think."

The Price of Improvement

We must turn back from the thought that man may live long enough and be vigorous enough to think, to consider with practical realism how it is to be accomplished. If we are persuaded that the subject is worth attention, what is the price? We have to regulate our food intake by the principles of nutrition, and that means in probably nine cases out of ten altering habits and disciplining likes and dislikes. Not only is there a biological and chemical side to the science of nutrition, but there is also the psychological and cultural side, which is the domain of the social sciences and is concerned with food habits, patterns, and attitudes, all of which are influenced by deep-rooted customs and traditions. Failure to reach the standards for food consumption laid down by the experts in nutrition is quite often caused by either the economic pattern, or the food habit pattern, which has all the strength of the cultural tradition of a people.

But Mark Twain's advice is effective if put to the test. The science of nutrition is a progressive process, changing with increased scientific knowledge; with alterations in the form of society; in the methods of rearing children; in the incidence of disease and the emergence of new ones; with new discoveries, such as insulin; with environment through erosion, pests, and climate; with the cultural attitude to food—whether it is thought of as something to eat or something to sell; whether the need for food is considered a natural right of all men or whether it is legally restricted to those who earn their living; and finally, whether the aim is merely an adequate diet or the optimum one.

Eating, like everything else we do, is largely a habit, and fundamentally a very pleasant one. It is true that many of us in our younger days were at variance with our parents on the major issue of whether we ate to live or lived to eat. There should be pleasure and aesthetic satisfaction through food which does serve more purposes than nourishing our bodies. Our food habits are interwoven with our entire way of life. Certain foods have status and carry the implication of position and independence. The desire for white bread has probably arisen because in the older European cultures it was the food of the upper classes, while black bread was food of the lower-income groups. Though it is true that nutritionally the cheaper cuts of meat are equal in value to the dearer ones if suitably cooked, many people will resent being advised to use the cheaper cuts.

Most people dislike looking on their food as a moral or a health problem. It is not only the children who rebel against eating certain foods because they are good for them. When untroubled by shortages or illness, people tend to choose their food largely to please their palates or their sense of status. Generally they like certain foods because they were brought up on them and they avoid others because they seem strange.

Income and Education

It is of interest to consider the opinions of eminent men in England after the experience of a nation-wide interference in people's food habits in England during the war. Lord Horder, president of the Food Education Society, stated last year:—

"Some of us are optimists on this subject and some of us are not so hopeful as others. Sir William Crawford says: 'The average man desires a healthy body; he is only too ready to be advised about his diet.' Well, I admit the first statement to be true; there are many advantages in having a healthy body. But every man is not prepared to pay the price of possessing a healthy body. Pleasant habits are not easily broken, and we must face the fact that many people like the diets to which they have been accustomed and are unwilling to change so long as they are not ill. The prospect of being fitter than they are is to many folk quite illusory; that is why many people waited for an all-in war to effect the change. Nor do I think that those who made it then because they wanted to be efficient to fight the enemy were as numerous as those who were forced to make it by the necessity of the wartime larder.

"Then there are those who believe that it is only necessary to pay people higher wages to convert them to a health-giving diet. Mr. Bacharach, for example, closes his illuminating book on 'Science and Nutrition,' with a statement of this belief: 'For the vast majority of the world's workers what is wanted is simply more money. With that will inevitably come the purchase of more food by those who need it, and the rest will follow.' I wish I could feel quite convinced that this would be so. I agree that economic changes are necessary. I

agree that poverty lies at the root of much of the trouble. I agree that to make good food available at prices everybody could pay has been well worth the subsidy that it has cost the nation during the war. All the same, to quote from Burnett and Ackroyd's 'Nutrition and Public Health': 'It is clear that a mere increase in wages would not eliminate that dietary deficiency associated with poverty. **Education is also necessary, and not only for the poor; and education should include instruction in marketing, food values, cooking, and methods of preservation.** I do not think that to make health-giving foods available for all corrects the habits of three generations—habits which though they were originally the result of economic conditions to a large extent, have become pleasant, say what we will, and those habits become fixed very early in life."

Source of Eating Habits

Where do they become fixed? Mr F. Le Gros Clark replies:

"A man usually acquires his personal tastes for food within the family, and the preferences he manifests in restaurant, snack bar, or factory canteen are usually conveyed there from his domestic experience. But what happens in each family from the moment a newly-married couple set up house together is still largely a matter of surmise. Somehow a compromise is reached and a dietetic formula established. Habits are affected by the wife's ability to cook and to apply such training as she has had to the home conditions in which she finds herself. The young woman has often acquired a better notion of the theory of food values than her husband, but in any conflict of choice it is usually the breadwinner who decides. . . .

"We could no doubt learn more about this family formula and its many variants. Probably we should, for it is in this medium that food habits are made and changed. Society is still a texture of families. The task of influencing the pattern of food habits is a problem not of health or personal hygiene, but in inducing a gradual change in social outlook. Boys should receive at school some training in the handling and preparation of food and in elementary food values. The tradition that cooking is the work of girls can be broken, and the sooner it is broken the sooner shall we resolve the obdurate pattern of food prejudices that is more characteristic of adult men than of their wives."

Mr. Clark considers that the school canteen is the ideal medium for this process of educating public tastes, especially if committees of parents are drawn into the service of the canteen and its direction, as the necessary link between home feeding and school feeding of the child would be established. There are in New Zealand country centres many experiments in hot school lunches where this co-operation between home and school exists. The home science teacher serves the community by keeping busy people in touch with significant discoveries in nutrition. Perhaps more will be heard about them and their influence on the food habit pattern.

Another worker in this field, Dr. Ethel Waring, of Cornell University, has shown that new food habits can be learned and old ones changed with ease. This takes place at nursery schools or play centres, but similarly needs the co-operation of both parents and teachers.

Food habits cannot be thought of in isolation from the rest of the life of the family and the community. As they are interwoven in the whole way of life of a people, families must consider food in relation to other wants and must choose among them. They need to consider costs, relative importance of other needs, and the money and material that are available. He'p may be welcome in improving this ability and disposition to choose, plan, and decide carefully. Family willingness and ability to think independently are basic to a vigorous democracy, as is good food.

It is hoped that it will be possible to meet groups to discuss the relation of food not only to health problems and farm programmes but to costs in relation to family incomes and their other needs.

World-wide Application

This knowledge needs to be applied everywhere that world resources may be better used for human welfare. The Food and Agriculture Organisation of the United Nations conceives its work as building up knowledge of the nutritional state of the world's people in greater detail and furthering agricultural production to bring about better distribution, improved nutrition, and the welfare of rural populations. There are many difficulties and no scientific wand to wave. For example, compare conditions in India and New Zealand: Infant mortality is 169 for every 1000 live births in India, and 32 in New Zealand; life expectancy at birth is 22.6 years in India (1931) and 66.2 in New Zealand (1930).

The task will call for all the wisdom and will that nations can muster. Nations need a comprehensive reporting system so that an accurate picture can be drawn of production, actual and potential. If progressively higher goals are to be set all over the world for nutritional well-being, for health and standards of living, each country needs to inquire into its own standards and, by sending in reports to the Food and Agriculture Organisation as an information bureau, enable that organisation to bring countries together in co-ordinated action.

Food can be managed for the welfare of people and nations. Everyone can make a contribution, and not least is that of the individual housewife who prepares meals for her family. In the less-developed countries, and likewise in many areas of other countries, the most elementary needs have to be met: Home storage of fruits and vegetables, simple methods of storing eggs on the farm, home preservation of food, sanitary handling, cooling, and pasteurising of milk—everything that will help to make a more varied supply of good food available to more people throughout the year.

The application of present-day knowledge has been largely responsible for the fact that for the first time in history during a great war the nutrition and health of the people as a whole in many nations not only did not retrogress, but actually improved. It should be possible without the manifold handicaps and distortions of war, and with nations acting together, to accomplish much more in the times of peace.

I should be glad to hear from farm families who are interested in the development of food production from the home garden and orchard.

Acknowledgments

Yearbook on Human Nutrition—U.S.D.A., 1939.

Presidential lecture to Food Education Society, Britain—Lord Horder.

"Food Habits and How to Change Them"—F. Le Gros Clark.

Publications of the National Research Council of America.

General Report of Reviewing Panel of the Food and Agriculture Organisation of the United Nations.

SEAGULLS

Today, a child discovered
With wild delight
The loveliness of gulls in flight—
Held up little eager hands
To white wings lifting from grey sands.
Would one could remember
First impressions of such things,
For there is still great wonder
In a seabird's wings!

—"Tinkle Tinkle," Dunedin.

"A Humorous Incident"

IN seeking to define humour I cannot do better than quote the opening paragraph of the essay by "Alix," Wairoa. She writes: "Humour has been described as a mental quality which delights in ludicrous and mirthful ideas, a quality we all have pleasure in possessing and using when the ludicrous concerns another person. The humour probably arises from a sense of relief that it is someone else and not ourselves who is ludicrous. Whatever it is, humour is relished by the greatest of men, and often can be of the utmost help in easing the tension or worry which is so often our portion."

WINNING ENTRIES WERE: First prize, "Joysabel," Rakaia; second prize (equal), "Catriona," Hamilton, and "Catherine Kelliher," Christchurch; highly commended, "Homespun," Halcombe.

First Prize

WOMEN have a wonderful sense of humour, but a mere male's is often somewhat perverted. I had ample opportunity of proving that during my days as a nurse. In a certain room of the military block were four of the most exuberant spirits one could meet. They were great soldiers with more than one battle and their wounds to their credit. This particular day I was attending patient No. 3 when I heard footsteps coming down the corridor. "Shh! Here she comes," said one; then as if by magic four young men assumed astonishingly saintly expressions.

I ruefully viewed the change of atmosphere—surely a storm was brewing. Into the room came Nurse Brown, the latest addition to our staff. Nurse Brown was ruddy, short, and buxom. To do her justice, she was more than buxom—in fact, her proportions were such that they would have delighted the early Dutch painters. She was also a brand new "pro." Having delivered a message to me, she was about to leave the room when a meek little voice piped up from the corner," Oh, Nurse Brown, please get me my book; it is under the bed."

Obligingly, but embarrassed by even such a simple request, she bent to retrieve the errant book. Now bending with the maximum of dignity and modesty isn't easy, particularly when one has more than one's fair share of avoirdupois, not to mention a uniform several sizes too small. Fully aware of the situation and doing her best to cope with it, Nurse Brown tackled her task. All eyes were turned on the nurse. I sensed drama. Would she reach it, or wouldn't she? She bent further, straining and panting a little. Then it happened!

There was a loud rending, like the sound of cotton fibres being torn apart. The book forgotten, Nurse Brown assumed a smart upright, and in her confusion turned a delicate puce and fled from the room, desperately clutching at her waist.

Suppressed giggles around me became less and less suppressed till at last the room was in an uproar. I did my best to ignore the situation. At length, after the patients had enjoyed themselves immensely, the chief offender called me over and produced from under the bedclothes a bandage neatly torn in two. In a flash I realised what had happened. The bending and ripping process had synchronised perfectly.

"You fiends," I said, and stalked from the room, wearing what I hope was a "We are not amused" expression. Once down the corridor I paused and couldn't help just the tiniest smile. Still, as I said before, a mere male has a perverted sense of humour and I don't approve of it!

—"Joysabel," Rakaia.

Second Prize (equal)

BEFORE I became a confirmed gardener I gave considerable thought to hands and complexion. Nowadays, about once a year, it becomes clear to me that STEPS must be taken, and take them I do with a reckless enthusiasm that lasts for fully a week, though after this I don't believe I'll have another attack till I'm "by caring."

The whole family were out and an unwontedly quiet house seemed to invite some special activity, so, producing a recommended and expensive facial pack, I prepared to enjoy myself. I hadn't begun to "set" when there was a knock at the porch door, and, forgetful of my odd appearance, out I went. A little Maori boy gave a howl of pure horror, and presumably took to the bush, as I have not discovered to this day what he wanted.

A trifle shaken and with my housecoat billowing round my ankles I went into the garden, where a bee stang me just below the knee. Kilting my flowing skirts I set off at a hand gallop for the blue-bag, only to find that it is almost impossible to minister to an injury in the bend of the knee while wearing long skirts. While doing my unpicturesque best, a smothered gasp made me look up. The gasper didn't wait to sell me any stock-lick —he seemed to feel that the open road called to him, and this time my unnaturally immobile features told me why. And to add insult to injury, you just can't see any difference!

—"Catriona," Hamilton.

Second Prize (equal)

JUST another incident in everyday life which leaves no doubt that the town girl still has much to learn from her country cousin!

John had been planning, planting, and hoping for the past few weeks since he had received word that his Edinburgh bride was due to arrive. Now for once he had defeated time and the house and garden were all he had wished to show Keitha when she stepped into her new home. At last the longed-for day arrived and John, after meeting his beloved wife, drove up to "Highlands" with all the pride of a young spouse. Keitha was more than proud of her John for the sight which met her eyes—a delightful little house nestled on the brow of a hill, surrounded by a well-laid-out and thriving garden.

However, much as he would have liked to have forgotten his responsibilities, "Beauty," "Strawberry," and the remainder of his pedigree herd required attention, so very reluctantly John left Keitha establishing herself in her new home while he went, gaily singing, down to the cowshed.

All was serene until Keitha, hearing a most unusual sound, grew so curious she went out the back door to investigate its origin. She was not prepared for the sight which met her eyes, though—her first glimpse of New Zealand prime pork on the run! John had gone through the garden gate forgetting to secure the latch! Keitha's one thought was to save some, if possible, of John's plants from sure destruction. Dashing inside again the first likely-looking object to catch her eye was the coal bucket. This she grabbed up, sped outside (keeping at a safe distance), and beat with a piece of wood, thinking she would frighten away those dreadful pigs. To Keitha's horror they charged her, no doubt thinking she had a tasty meal for them, and the scared little Scottish lass could not get inside quickly enough as she frantically called "John! John!"

Never will she be allowed to forget the first event in her life as a farmer's wife! She laughs now herself, as after a year of patient learning she has developed into a proficient housekeeper and ardent advocate of a life on the land.

—"Catherine Kelliher," Christchurch

MEALS FOR THE INVALID

By EVA TOPPING, *Rural Sociologist, Auckland.*

WHEN there is an invalid or convalescent patient in the house extra care must be taken to provide light, nourishing, and appetising meals. In a sick person the senses are more acute. Mistakes or carelessness in preparing and serving food are noticed when they would be overlooked by the healthy person. During the acute stages of an illness even the thought of food is distasteful, but after this phase has passed meals play a large part in an invalid's life.

IT is not only what the meal consists of, but how it is prepared and served that counts. An attractive-looking meal tempts the fickle appetite and encourages the patient to eat and so build up lost strength. Doctor's orders about specific diets must always be scrupulously carried out, but certain general principles apply in all cases.

Tray, Crockery, and Linen

The appearance of the meal is important and needs to be considered carefully. First, the tray, traycloth, and china must be spotlessly clean. The tray should be light enough for easy handling in bed, but avoid a thin metal tray which sags or buckles with a loud crack. Many an accident with a glass of milk or bowl of soup has happened through using a tin tray which suddenly "cracked." A tray with legs will be found very convenient and comfortable to use.

Choose the prettiest traycloths and change them frequently, never using one that has any stains from a previous meal. Provide a table napkin or freshly-laundered handkerchief, and in many cases a small cloth to cover the top of the sheet and bedclothes will be appreciated. Dainty and colourful china will help to make a simple meal look more inviting, so this is a time to use the little odd pieces which are often reserved for special occasions.

A small posy arranged in a tiny vase or egg cup, or one choice bloom laid on the tray, will add that extra finishing touch which makes the invalid feel surrounded by loving care. But be sure the flowers are not harbouring insects, or the result may be very different! Polish tumblers so that there are no fingermarks, smears, or particles of dust and cloth to spoil the clean, sparkling effect of the glass.

Colour and Variety in Food

The appearance of the food is also very important, and thought should be given to the choice of foods to combine in a meal. Could there be a more dull and uninteresting-looking meal than white steamed fish, mashed potatoes and cauliflower with white sauce? A little colour will make all the difference. Change the vegetable to mashed carrot, stir chopped parsley into the potatoes, and decorate the fish with a lemon butterfly. The whole effect is improved and the meal becomes tempting. Garnishes of chopped parsley, sliced tomato or beetroot, diced carrot watercress, and lemon are useful for giving a "lift" to a dish—and also provide extra vitamins.

Give small helpings at first, as a convalescent's appetite is quickly discouraged by the sight of too much food. A second helping can be given if needed. Try not to ask

what is wanted, but make each meal a surprise, varying the dishes as much as possible. Monotony is fatal to the appetite. People in good health usually have short memories of what they have eaten, but an invalid's thoughts are inclined to dwell on food.

Likes and dislikes should be considered too, for to do the most good the meals must be not only eaten but enjoyed. It is provoking to prepare a dish only to discover that it is the invalid's particular bugbear, the one dish that cannot be tolerated.

For Ease of Eating and Drinking

Cups, tumblers, and bowls are better only three-quarters full to prevent spilling. Soup and broth are easier to handle in bed if served in a cup or small bowl rather than in a plate, and will keep hotter. Make the meal easy to deal with—cut toast in fingers, small squares, or triangles, each of the same size and thickness; make bread and butter wafer thin, using butter as plentifully as the ration will allow and cutting the slices in halves or quarters or rolling them. Meat should be thin, with gristle or bone removed. Cut it into convenient-sized pieces if the invalid's hands are shaky.

Remove the tray as soon as the meal is finished. Half-eaten food and soiled dishes are a depressing sight at the best of times. Note what is left, as it will give an idea of the invalid's preferences and may sometimes indicate the nature of the illness. If the meal is to be served hot, see that the plates are warmed and a warm plate is inverted over the serving plate to keep the food piping hot. Similarly, cold dishes should be really cold, though not chilled. Suit the food to the weather; hot soup is comforting on a cold raw day, but not so acceptable on a warm summer day, though a bowl of jellied soup might be taken with relish.

Serve Meals Attractively

A good meal can be spoilt by the discomfort of the patient, so pay particular attention to service. Shake up the pillows and arrange them to give plenty of support. Don't forget to place one under the knees. A bed jacket, woollen scarf, shawl, or a small square of blanket should cover the shoulders. Have a glass of fresh water at hand; a few sips will sweeten the mouth before starting the meal. The tumbler of water, the covering plates, and a second course can be put within easy reach on a bedside table to lessen the weight on the tray. Be sure that everything needed for the meal is at hand—salt and pepper, sugar, milk, sufficient spoons, forks, and knives. If the tray is not quite level, push a cushion, pillow, or book under the corner. Encourage a little rest before and after a meal, as rest aids digestion.

Foods to Give and Avoid

Illness and lack of exercise impair the digestion, so all indigestible foods and some ways of preparation are barred. Twice-cooked meat (such as rissoles and shepherd's pie), pastry, curries, and highly-seasoned foods, pickles and sauces, new bread, hot scones, and any foods known to disagree with the individual should be avoided. Frying and roasting are not as suitable as steaming and boiling.

The "building-up" foods—fish, meat, eggs, and cheese—are needed to restore tissues damaged or wasted during illness. Unless they are forbidden by the doctor they should all be included in the diet, cooked so as to be most easily digested. White meats—chicken, rabbit, tripe, sweetbreads, and brains—are more easily digested than beef and mutton and should be used in the early stages of convalescence, gradually progressing to normal diet as the patient improves.

Plenty of grapefruit, lemons, and oranges, or, if they are unobtainable, rosehip syrup and black currant puree, raw and cooked vegetables, and tomatoes, should be given; it is most important for the invalid to have a daily supply of vitamin C to restore health and protect against further sickness. Packet jellies, meat extracts, and bone broths tempt the appetite, but their food value is not very high. Such things, though useful, should not form the mainstay of the invalid's diet.

Flat tray set with light breakfast of raw pear, buttered toast fingers, boiled egg, marmalade, and tea.

Mid-morning snack for the convalescent: Thin wheat germ bread and butter and glass of egg nog.

y set with midday meal: amed fish with lemon, mashed ots, and mashed potatoes. ed custard and apple puree, with small jug of top milk.

Milk Diets

When a milk diet is ordered monotony is just round the corner, so vary the flavours and ways of serving as much as possible. For drinking cold, milk can be flavoured with lemon, vanilla, meat extract, or brandy. Children will drink milk if it is flavoured and lightly coloured. Colour raspberry and strawberry flavours a faint pink; lemon flavour yellow, and orange flavour with orange.

Hot milk drinks can have flavourings of cocoa, coffee, malt, tea, salt and pepper, nutmeg, or ginger. For something more solid make junket, plain and flavoured; custard, baked or boiled; milk jelly, milk soup, and ice cream, if allowed.

Recipes for the Invalid

EGG NOG

1 fresh egg, 1-2 teaspoons sugar, or 1-2 tablespoons honey, 1 cup milk, ¼ teaspoon vanilla essence, nutmeg.

Beat the egg with one or two teaspoons of sugar, according to taste, till it is frothy and lighter in colour. Add milk flavoured with vanilla and pour into a long tumbler. Grate a little nutmeg on the top.

To vary the egg nog, omit two tablespoons of the milk and substitute the same amount of sherry or other wine, or flavour the milk with cocoa or coffee.

If a warm drink is required, heat the milk almost to boiling point before adding the beaten egg, sweetening, and flavouring.

GINGER MILK

1 cup hot or cold milk, 1-2 tablespoons honey or 1-2 teaspoons sugar, ¼ to ½ teaspoon ground ginger (according to strength of flavouring desired).

Mix the ground ginger and honey or sugar. Add to the milk, whisk well, and serve. Grated nutmeg or ground cinnamon can be used in place of the ginger.

BARLEY WATER

2oz. pearl barley, 8 cups water, sugar to taste, ¼ teaspoon salt, lemon rind, lemon juice.

Wash the barley and add to boiling water, with lemon rind and salt. Simmer two to three hours, strain, sweeten, and add lemon juice to flavour.

SWISS COCOA

1 teaspoon cocoa, 1 cup hot milk or milk and water, 1 heaped teaspoon sweetened condensed milk.

Mix the cocoa and condensed milk to a paste. Add the boiling milk and stir well.

APPLE DRINK

2 apples, 3 cloves, juice and rind of 1 lemon, 2 quarts water, 6 teaspoons sugar.

Wash the apples, remove the stalks, and cut in slices without peeling or coring. Peel the lemon rind very thinly, using none of the white pith. Simmer gently for one hour. Strain, and add lemon juice and sugar.

LEMON DRINK

3 large lemons, 3 to 6 tablespoons sugar, 3 pints water.

Pare the lemons thinly, put them in a saucepan with sugar and water, and boil for a quarter of an hour. Remove the pieces of rind, cool, and add lemon juice.

LEMON SODA

Juice of 1 lemon, ¼ teaspoon baking soda, 2 tablespoons sugar, iced or cold water.

Mix the sugar and lemon juice, and add the water in a jug. Pour out three-quarters of a tumbler of lemon drink and add a quarter of a teaspoon of baking soda. Stir quickly and serve at once.

Glucose, being less sweet than sugar, can be added in larger quantities and so provide extra energy.

CHICKEN BROTH

Clean an old fowl, remove the fat, and cut in pieces. Cover with two quarts of cold water, add one teaspoon of salt, and let it stand for about half an hour. Heat slowly to simmering point and keep at same temperature for three hours, covered closely. Strain into a basin and set it aside for the fat to rise. Skim the fat, add ½oz. rice (if rice is unobtainable, one dessertspoon of coarse oatmeal), and simmer till the oatmeal or rice is cooked. Serve in a small bowl or cup with finely-chopped parsley sprinkled on top.

BEEF TEA

1lb. lean beef (topside), 1 pint water, ½ teaspoon salt.

Remove all fat from the beef, mince it in a machine or scrape it with a sharp spoon to shred. Put the prepared meat in a saucepan, add salt and water, and leave to stand for 20 to 30 minutes. Set the pan over a low heat and stir slowly till the meat loses colour and the liquid is red-brown. Take care not to let the liquid boil. Strain and serve hot with toast fingers.

PEASANT SOUP

½ pint water or stock, ¼lb. mixed vegetables, 2-3 tablespoons breadcrumbs, ½oz. grated cheese, salt and pepper, 1 tablespoon chopped parsley.

Prepare and dice the vegetables, and cook them in stock or water till tender. Add the breadcrumbs and beat or rub through a coarse sieve. Use salt and pepper to taste. Add the cheese and parsley just before serving.

BAKED CUSTARD

1 egg, slightly beaten, 1 cup milk, ½oz. sugar, vanilla essence, nutmeg.

Beat the egg and add the sugar, a pinch of salt, vanilla essence, and milk. Stir well. Pour into small pie-dish and bake in a moderate oven about half-an-hour till set. Do not have the oven too hot or the custard will boil and the even texture is spoilt.

To vary a baked custard try some of the following:—

Honey.—Substitute honey for sugar, leave out the vanilla and nutmeg, and sprinkle with ground cinnamon.

Savoury custard.—Omit the sugar and flavouring, and add salt and pepper, chopped parsley and chives, and a few leaves of thyme if liked.

Cheese custard.—Omit the sugar and flavouring, and add three-quarters of a cup of grated cheese, pepper, and salt.

LEMON WHIP

1 cup water, 1 level tablespoon gelatin, ¼ cup lemon juice, ¼ to ½ cup sugar.

Soak the gelatin in a small quantity of the water, and heat the rest with the sugar. Pour on to the gelatin and stir till dissolved, add the lemon juice, and leave to cool. Beat well when beginning to set and fold in one stiffly-beaten egg white. Pour into a wet mould and leave to set. Serve with custard sauce, made with the egg yolk.

CUSTARD SAUCE

1 egg yolk, 1 to 1½ teaspoons sugar, 1 teaspoon cornflour, 1 cup milk, pinch of salt.

Blend the cornflour, sugar, and egg yolk with some of the milk. Bring the rest to the boil and pour on to the egg mixture, stirring constantly. Return to the saucepan and bring to the boil again to cook the cornflour.

Any kind of fruit juice can be used to make fruit whips. Use juice from stewed or bottled fruits in place of the water and lemon juice.

Photographs by Sparrow Industrial Pictures Ltd.

WILD FLOWERS

Blue-opal of linseed,
Rose-pink of clover,
White of the minute-flowered viola,
Azure of speedwell,
Scarlet of pimpernel,
Berries fashioned from orange wax;
Lavender-pink of the wild road-flax,
Yellow of ragwort,
White of yarrow—
These are the colours the wild flowers weave,
Hidden in grasses, hidden in leaves.

—Gweneth Bell.

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RELIEF OF DISTRESS IN GREECE

"IT is difficult to realise the value of wool in the lives of people in country districts," writes Dr. C. S. M. Hopkirk, a New Zealander on the staff of UNRRA, to New Zealand's CORSO headquarters in an appeal for assistance from this country to relieve distress in Greece. "It means the difference between frostbite in the snow and some degree of winter comfort. Their own sheep give them some wool, but New Zealand wool is better for spinning." Children's underclothes, toys, and educational supplies are desperately needed too.

"I want to stress the need for a further and larger donation from farmers of New Zealand to arrive before Christmas," Dr. Hopkirk writes.

The greasy wool in sacks (which will hold one fleece) should be sent to the nearest CORSO committee or nearest Red Cross Society depot, or, as with donated bales, should be sent to the nearest Ministry of Supply store at Auckland, Wellington, Lyttelton, or Dunedin.

Thousands of small children in Greek orphanages and villages have never had soft cuddly toys, animals, balls, etc., and the most elementary materials for conducting school are lacking in many areas. There will also be a great need of more adequate footwear in the rainy season approaching.

Toys, children's clothes, and educational supplies could be handed in to the nearest CORSO committee or sent direct to CORSO, Tisdall's Buildings, 100 Lambton Quay, Wellington.

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Garden Work for October

MANY **herbaceous perennials** can be increased readily at this time of year by means of cuttings. When the new shoots are a few inches high they should be removed by scraping soil away and cutting them off as low as possible. Cuttings of lupins, delphiniums, etc., will root very easily in cold frames.

Dahlias to be grown from last year's roots should be lifted, divided, and replanted, making sure that each root has at least one bud on it. (Dahlias are better grown from cuttings—see garden notes for August.)

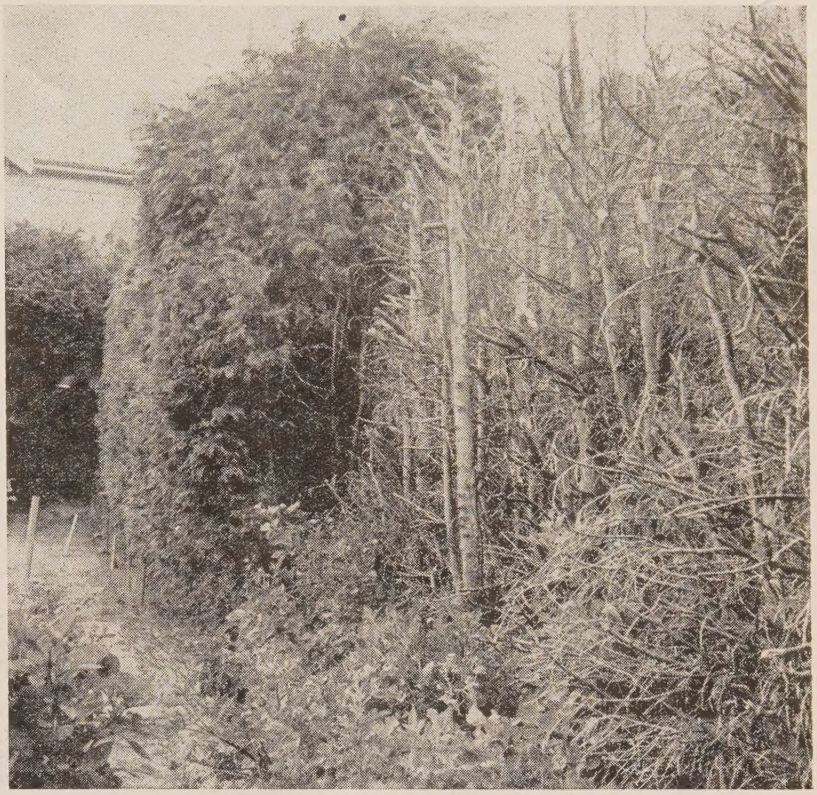
Annuals should be thinned out as soon as the seedlings are large enough to handle and recognise. Thin first to about 2in. apart each way, and later, when they are larger and out of danger from accident and insect attack, thin again to 6 to 8in. apart. Crowded annuals flower once and then die; if each plant has room for full development, it will continue to flower for a long period.

St. Brigid anemones can easily be raised from seed sown in October or November. Allow a few of the finest flowers to go to seed, and sow as soon as the heads are ripe and the fluffy seeds will part readily from them. The seedlings are small and at first grow too slowly to compete with weeds in the seed row. To avoid trouble from weeds, draw out a V-shaped drill, 4in. wide and deep, and fill in with soil sterilised in the wash-house boiler to kill weed seeds. The anemone seeds should then be teased apart as well as possible, and sown in small tufts 1in. apart each way and ¼in. deep in the sterilised soil. Transplant the seedlings when they are large enough to handle and plant them in the autumn to flower in the following spring.

Evergreen shrubs: The transplanting of evergreen shrubs is probably best done in early spring, as the plants will then re-root quickly. It is usual to remove a few shoots or branches to relieve the strain on the roots. The hole dug should be large enough to allow the roots to be spread out before the soil is replaced.

Dead flower heads should be picked off and not allowed to go to seed. If this is done systematically throughout the season, most annuals and herbaceous perennials will flower for much longer, as the plant's strength will be thrown into producing flowers instead of seed.

Staking: Herbaceous plants should be staked in plenty of time. It is too late when a gale has flattened plants to the ground. Delphiniums, chrysanthemums, and others with a heavy head of flowers are best supported with hardwood stakes driven well into the ground behind each clump (or in a triangle around it in exposed places). As it grows the clump is surrounded by strings tied to the stake. Jarrah (*Eucalyptus marginata*) stakes are best, if obtainable. Manuka stakes are also serviceable though more unsightly.



[*Photo News.*

Coniferous hedges may be trimmed frequently and lightly, but should never be cut back hard, as the old wood will not produce new shoots. These *Cupressus (chamaecyparis) Lawsoniana* hedge trees have been killed by being cut back too hard.

The lawnmower: Before starting to mow the lawn regularly overhaul the mowing machine. It should be well oiled and, if necessary, the blades ground and set. The blades should run freely with no chattering noise (which is a sign of a deformed blade), and should cut a piece of writing paper put between the blade and bottom plate.

Garden pools should be cleaned out in the spring. If water lilies are grown in baskets or tubs, it is a good plan to remove as much of the mud from around the roots as possible and replace it with a mixture of good garden soil and old cow manure, but the roots must not be allowed to dry out while this is being done. Most varieties thrive in 2 or 3ft. of water, but *Nymphaea tetragona (pygmea)* requires only 9in.

Box edgings which are to be renewed should be dug out as soon as the first sign of new growth is seen, split up, and planted back again. Syringe the plants each evening for the first few days after planting if the weather is hot and dry.

COMPETITIONS

OCTOBER: The current essay competition closes on October 15. Subject: "A Courageous Act."

NOVEMBER: Most of us have a few treasures which we prize, though not necessarily for their intrinsic value, and it should be a pleasant task to record their history.

"TREASURED POSSESSIONS."

The closing date is November 15. First prize, 10/-; second prize, 5/-.

"MARY,"
"Journal of Agriculture,"
Box 3004, Wellington.

Housing Survey of Rural Districts

Work of Department of Agriculture

ARE you planning to build a new house? Do you want to make some alterations in your home? Have you been looking hopefully through books and magazines to find the perfect plan that will fit your needs and bank account, and turned away disappointed because there is nothing that is just right? Have you ever grumbled that "Whoever planned this house couldn't have thought much about trying to bring up a family in it"?

If you can answer "Yes" to any of these questions, you will be interested in answering some more questions in the Rural Housing Survey of the Department of Agriculture. This Department wants to introduce a new service for farm families, a service which will provide plans for new houses suitable for farm and family requirements, and suggestions for improvements and remodelling in old-fashioned homes.

But if these plans are to be really useful, they must be based on an accurate knowledge of present-day conditions, and of what farm people want. No one can provide this information but the families concerned.

The Rural Sociology Section has prepared a schedule which asks about the age, size, and equipment of farm houses, and about preferences in such items as coal or electric ranges, and accommodation for workers. Copies to fill in will be sent to anyone who is interested.

The results, a summary of which will be published in the "Journal of Agriculture," will be used in preparing house plans, and will also be of great value in giving a general picture of farm housing conditions in New Zealand.

Your co-operation in helping with the survey will be very much appreciated. Individual information is, of course, confidential.

Fill in the application form for a questionnaire below and post it to the Rural Sociologist for your district:—

The Rural Sociologists will also answer inquiries from country women about nutrition, preparation and preserving of food, and home management generally. Make use of this service.

North Auckland and Auckland:	Rural Sociologist, Department of Agriculture, AUCKLAND.
Taranaki, Wellington, Hawke's Bay, Gisborne, Nelson, and Marlborough:	Rural Sociologist, Department of Agriculture, WELLINGTON.
Canterbury, Westland, Otago, and Southland:	Rural Sociologist, Department of Agriculture, CHRISTCHURCH.

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Department of Agriculture.

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Name .....
(Block letters)

Address: .....

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